THE IRON TRADE REVIEW

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Mills Unable to Meet Tremendous Demand

And Are Falling Far Behind in Deliveries—Large Stocks of Virginia Pig Iron Wiped Out—Very High Coke Prices

Greatest exertions possible are failing to produce finished materials to meet the tremendous demands of consumers and tonnages of shapes, bars and plates which can be obtained for delivery before July of next year, except from a few mills at high premium prices, are gradually diminishing. Inability to obtain anything like prompt deliveries is delaying many projects and causing less activity in placing new orders. This is a welcome relief to over-crowded mills.

Iron Ore

An additional sale of 75,000 tons of Wabana ore has been made to an eastern Pennsylvania furnace at 7¼ cents per unit, Philadelphia. Leading sellers of domestic ore in the east are expected to announce 1912 prices at an early date. The movement of Lake Superior iron ore continues very heavy and this month will probably make a new record for any October in the history of the Lakes.

Pig Iron

Pig iron stocks throughout the country continue steadily to decline and the unsold tonnage is being rapidly reduced to small proportions. Stocks in Pittsburgh and the middle western district, apart from the Corporation, declined about 8,000 tons during the first half of October, and stand now at about 475,000 tons of all grades, a very large part of which has been sold. In Virginia, for the first time in five years, stocks are below 150,000 tons, and the booked sales largely exceed this figure. Sales of the leading Virginia company since Oct. 1 have amounted to 70,000 tons. The wiping out of the huge stock of Virginia iron, which has so long been considered a menace to the market, promises to have a decidedly strengthening influence in the eastern territory. A sale of 9,000 tons of Virginia No. 3 and forge was made at $14.50 to $14.75, furnace, before the last advance. The two recent advances have put Virginia iron up $1 per ton, to $16, furnace, for No. 2 for this quarter and the first quarter of next year, while for the second quarter of next year, $15.50 for No. 2 is quoted. Along the lakes, including Toledo, Buffalo, Detroit and Cleveland, prices are very firm, and at Cleveland, following liberal sales at $16.50, furnace, prices have been advanced and ruling quotations are now more nearly equal to those prevailing at other lake cities, where from $17 to $17.25 is being paid for No. 2 foundry. In St. Louis, an inquiry is pending for 15,000 tons of basic. The basic market in the east, on which quotations have been nominal for some time, is now more clearly defined by a sale of 5,000 tons for first quarter at $17, furnace. Some furnaces are now quoting $17.50, furnace. New inquiry for basic for first half delivery at Pittsburgh foots up fully 20,000 tons.

Railroad Buying

October has been the banner month of the year in purchases of steel rails and contracts formally closed already exceed 600,000 tons, including large orders from the Pennsylvania, New York Central, Harriman, Illinois Central, Louisville & Nashville and other lines. The Harriman lines ordered 100,000 tons of open-hearth rails, of which 75,000 tons will be rolled by Steel Corporation mills and 25,000 tons by the Colorado Fuel & Iron Co. Supplementary orders are expected to bring this total to 200,000. The Illinois Central has ordered 50,000 tons from the Illinois Steel Co. The Maryland Steel Co. has taken orders for 25,000 tons of Mayari Bessemer rails. The Louisville & Nashville has ordered 90,000 tons from the Tennessee Coal, Iron & Railroad Co. Railroad officials and car builders have not fully disclosed the extent of the car buying, which is now in progress. Inquiries for many thousands of cars are pending and orders of good size are being placed by leading railroads.

Shapes and Plates

Very few contracts of importance for structural material are being awarded. The lull is due entirely to the fact that few mills are able to give promises of delivery before July 1, 1913, and the few are asking premium prices. The McClintic-Marshall Construction Co. has taken a contract for 2,000 tons for extensions to the open-hearth department of the Republic Iron & Steel Co., at Youngstown. The Mexican Eagle Oil Co. is in the market for 18,000 tons of plates for oil tank construction in Mexico. A Canadian interest is inquiring for 60,000 tons of plates for pipe line construction.

Coke

Advancing coke prices and the scarcity of the fuel have caused much complaint on the part of consumers. These complaints have not had the effect of reducing quotations. Of prompt furnace coke, a considerable tonnage has been sold at $4, and 5,000 tons for shipment in the next fortnight went to a consumer just outside of the Pittsburgh territory at a shade less than $4. Sellers are holding firmly to $4 as their minimum quotation on furnace coke and $4.50 is being asked for prompt foundry coke.

PITTSBURGH

Pig Prices Advancing---Abnormal Coke Conditions

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg., Oct. 22.

Contracting for several lines of finished iron and steel products is beginning to fall off slightly. This feature, however, does not indicate an unhealthful condition of the trade. Consumers realize the impossibility of obtaining some material before the second quarter and are not attempting to place tonnages for that reason. Mills would welcome even greater inactivity so far as future contracting is concerned. Specifications against contracts continue heavy and manufacturers are being pressed for deliveries. The car shortage is more acute and complaint continues to be heard about the scarcity of labor.

Consumers of semi-finished steel who have not covered requirements for first quarter are confronting a serious situation. It is not probable that any of the large producers will be able to offer much surplus tonnage. Effort is being made to prevent prices of billets, sheet and tin bars advancing to such an extent that finished products would have to be quoted on a higher basis.

The scarcity and high price of coke have caused considerable anxiety on the part of consumers. Producers are unable to meet the heavy demand, and extremely fancy prices are being paid for both prompt and contract fuel. When normal conditions will return, is difficult to predict.

The pig iron market has been comparatively quiet, but quotations on some grades have stiffened somewhat during the last week. Many interests have trebled their melts the last fortnight and furnace operators are being urged for shipments.

Pig Iron.—The pig iron market is comparatively quiet, but no weakness is displayed. In fact, the general tendency seems to be toward higher values, and minimum quotations on foundry and malleable grades each have advanced 25 cents. Little or no trouble has been experienced in obtaining $16.50, valley, for either iron. Basic is being quoted from $16.25 to $16.50, valley, but no sales above the minimum figure have been noted. Many believe, however, it would be impossible to obtain basic at less than $16.25, valley. A small lot of prompt Bessemer sold the first of this week at $18, delivered, to a consumer in this district, which is 10 cents above the prevailing quotation. The Westinghouse Machine Co., this city, today entered the market for 1,000 tons of Bessemer and malleable and new inquiry for first half basic iron aggregates about 20,000 tons. The melt of pig iron in this territory is surprising; some consumers have doubled and even trebled their melts the last fortnight. Furnace operators are being urged for shipments and additional tonnages are requested in many instances. The scarcity of coke has caused some blast furnace operators to use off-grade fuel and the pig iron output is not so good. The car shortage is more acute and complaint about the scarcity of labor is heard. Quotations for prompt and first quarter iron follow:

(Remainder of Year and First Quarter.)	
Bessemer, valley	$17.00
Bessemer, Pittsburgh	17.90
Basic, valley	16.00 to 16.25
Basic, Pittsburgh	16.90 to 17.15
No. 2 foundry, valley	16.25 to 16.50
No. 2 foundry, Pittsburgh	17.15 to 17.40
Gray forge, valley	15.50
Gray forge, Pittsburgh	16.40
Malleable, valley	16.25 to 16.50
Malleable, Pittsburgh	17.15 to 17.40

Ferro-Alloys.—Sellers of ferro-manganese and ferro-silicon in this district are refusing to sell beyond the end of the year. The latter part of last week, a small tonnage of ferro-manganese sold at $61, seaboard, for shipment first quarter, and one agent announces the sale of a small tonnage for prompt delivery at $75, seaboard. Despite the fact that little or nothing has been said about contracting for ferro-manganese, it is understood several consumers in this district have covered requirements in the east.

We quote 80 per cent ferro-manganese at $61 to $75, Baltimore, for prompt delivery and $59.50 to $61 for forward shipment. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted nominally at $75, Pittsburgh, for prompt and forward delivery; 12 to 13 per cent, $25; 11 to 12 per cent, $24; 10 to 11 per cent, $23; 9 to 10 per cent, $22, f. o. b. Globe, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

On ferro-titanium we quote 8 cents per pound for carload lots; 10 cents per pound for 2,000 pound lots and over, and 12½ cents per pound in lots up to 2,000 pounds.

Plates.—Leading manufacturers of steel plates are unable to promise shipments before second quarter, and there has been a slight falling off in future contracting. Specifying continues equally as heavy, and mills are being urged for shipments. Where early deliveries are possible, premiums of $2 and $3 a ton are being paid. The Pennsylvania Lines West have not yet placed their order for 6,000 box cars, mentioned two weeks ago. The C. & O. road has entered for 3,000 coal cars, and the Chicago & Northwestern and Northern Pacific railways each have entered for about 6,000 cars of various types. The Mexican Eagle Oil Co. has put out an inquiry for about 18,000 tons of plates to be used in the construction of oil tanks in Mexico. It may be a year, however, before this transaction is closed. A Canadian interest is negotiating for about 60,000 tons of plates to be used in a riveted pipe line. Quotations are being firmly held. We quote:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.45c to 1.50c. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches 0.10c; circles, 0.20c. Plates in widths over, 100 inches up to 110 inches 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including 3-16-inch plate on thin edge, 0.10c; under 3-16 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets.—So far as can be ascertained, manufacturers of sheets are holding firmly to maximum quotations on all products, and on black sheets, and some makers are obtaining as high as $2.30 and $2.35 for No. 28 gage. Leading manufacturers advise that heaviest consumers already have covered requirements for the first quarter, and in some cases through

the first half of the new year. As a result, active contracting is expected to fall off considerably within another fortnight. Most of the tonnage for next year's shipment was placed on the basis of $2.15 for black, $3.30 for galvanized and $1.55 and $1.60 for blue annealed products, base sizes being referred to in each instance. Unless raw materials advance sharply in prices, it is not probable further advances in the values of sheets will be announced. A number of mills are unable to operate at desired capacity because of difficulty in obtaining raw material. None of the most important makers is able to promise shipments before next year, making it possible for some manufacturers to obtain fancy prices. The following quotations are maintained firmly:

Flat Sheets.

Black Sheets.—Nos. 10-12 gage, $1.90 per 100 pounds; Nos. 13-14 gage, $1.95; Nos. 15-16 gage, $2.00; Nos. 17-21 gage, $2.05; Nos. 22-24 gage, $2.10; Nos. 25-26 gage, $2.15; No. 27 gage, $2.20; No. 28 gage, $2.25; No. 29 gage, $2.30; No. 30 gage, $2.40.

Tin mill sizes, Nos. 15-16 gage, $2.00 per 100 pounds; Nos. 17-21, gage, $2.05; Nos. 22-24 gage, $2.10; Nos. 25-27 gage, $2.15; No. 28 gage, $2.20; Nos. 29-30 gage, $2.25; Nos. 30½-31 gage, $2.30; No. 32 gage, $2.35.

Blue Annealed.—Nos. 3-8, $1.60 per 100 pounds; Nos. 9-10, $1.65; Nos. 11-12, $1.70; Nos. 13-14, $1.75; Nos. 15-16, $1.85.

Galvanized.

Nos. 10-11 gage, $2.40 per 100 pounds; Nos. 12-14 gage, $2.50; Nos. 15-16 gage, $2.65; Nos. 17-21 gage, $2.80; Nos. 22-24 gage, $2.95; Nos. 25-26 gage, $3.10; No. 27 gage, $3.25; No. 28 gage, $3.40; No. 29 gage, $3.55; No. 30 gage, $3.70.

Roofing Sheets.

Net extras on all gages per 100 pounds. Corrugated 2-inch, 2½-inch, 3-inch and 5-inch corrugation, 5c; 2 V crimped without sticks, 5c; corrugated 1¼-inch corrugation, 10c; 3 V crimped without sticks, 10c; pressed standing seam with cleats, 15c; plain roll roofing with or without cleats, 15c.

Painted Roofing.

12 to 18 gage, inc., 5c; 19 to 24 gage, inc., 10c; 25 to 28 gage inc., 15c.

Tin Plate.—Tin plate consumers are beginning to place heavy tonnages with mills in this district and leading manufacturers announce that contracting is much heavier than it was a week or ten days ago. The fact that tin mills opened books earlier than usual this fall, combined with the belief that pig tin would decrease in price, is cited to account for the hesitancy showed on the part of consumers in covering 1913 needs. The $3.60 quotation is maintained firmly.

Coke tin plate, 100-pound basis, 14 x 20, $3.60, f. o. b. mill, Pittsburgh district.

Rails and Track Material. — Mills rolling rails all have sufficient tonnage on their books to keep them operating at capacity beyond the end of the year, and heavy tonnages are being placed with officials in the east. Demand for prompt rails continues heavy. Several makers of standard spikes are now quoting $1.85 per 100 pounds, although the $1.80 quotation continues to rule on the bulk of tonnage being placed. Rails are quoted as follows, with the base price on open-hearth standard sections 1.34c per pound at the mill:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.25c, the schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.10c to 2.25c, Pittsburgh.

Railroad Spikes.

4½, 5 and 5½ and 9-16	$1.80 to $1.85
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x 7-16	.20
3, 3½, 4 and 4½ x ⅜	.30
2½ x ⅜	.40
2½, 3 and 3½ x 5-16	.60
2 x 5-16	.80

Billets and Sheet Bars.—The market for semi-finished products has displayed no new developments this week and no sales have been made so far as can be learned. It is understood that a rather large tonnage of Bessemer billets was offered a few days ago at $28, mill, but no sale was made. That the semi-finished steel situation is acute in all parts of the country is indicated by the number of requests from distant points received by mills here for tonnages. Early this week, a representative of a Canadian interest scoured the market for prompt material, but was unsuccessful. Leading semi-finished steel makers report that no sales beyond the end of the year have been made. Considerable influence is being exerted by leading manufacturers to prevent products selling at unreasonably high prices next year, it being the hope of men in official capacities that open-hearth sheet bars, for instance, will not sell above $26.50. In recogniton of several sales of forging billets at $34, we quote this product at $33 to $34. Quotations follow:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $26.00, with the usual extra for size and analysis, and open-hearth rolling billets, $26.50. Bessemer sheet and tin bars are quoted at $27.00 and open-hearth sheet bars are quoted $28.00, f. o. b. Pittsburgh and Youngstown for fourth quarter, with full freight to destination added. Forging billets are quoted at $33.00 to $34.00, Pittsburgh.

Hoops and Bands.—The minimum quotation on hoops has disappeared, as was predicted by The Iron Trade Review a week ago. The leading interest is now quoting 1.50c, and this figure is not being shaded. Several makers, it is understood, are asking 1.55c. Bands continue to be quoted on a par with steel bars, and the bulk of the tonnage is going at 1.40c. There is not much new demand for either product, but specifying is liberal. Revised quotations follow:

Hoops in carload lots, 1.50c; Pittsburgh; in less than carload lots, 1.55c; bands 1.40c to 1.45c, base, with net extras, as per standard steel.

Merchant Bars.—Leading manufacturers are exercising influence to prevent steel bars advancing above 1.40c, although considerable tonnage is being booked at 1.45c, which is the quotation offered by several independent mills. It is difficult to obtain material for shipment this year, and interests in a position to assure prompt delivery are able to enjoy premium prices. Contracting continues heavy and in some instances mills are refusing to book additional tonnages. Specifying has been to the full extent of contracts. Makers of cold rolled shafting continue to quote 60 per cent off for carload lots and will not advance prices unless new quotations on steel bars are announced. Such was the assertion of one of the leading manufacturers the latter part of last week, immediately following a rumor that shafting was being quoted on an advanced basis. Makers of iron bars have advanced quotations $1 a ton and are now quoting 1.55c and 1.60c, and some manufacturers are quoting 1.65c. However, iron bars can be obtained at 1.55c to 1.60c. Revised quotations follow:

Common iron bars, 1.55c to 1.60c, Pittsburgh; Bessemer and open-hearth steel bars, 1.40c to 1.45c; plow and cultivator, 1.40c to 1.45c; channels, angles, zees, tees, under 3 inch, 1.50c to 1.55c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds and not less than 1,000 pounds of a size, 0.15 advance, less than 1,000 pounds, 0.35. Cold rolled, and ground shafting, 60 per cent off in carloads and 55 per cent in less than carloads delivered in base territory.

Muck Bar.—That it would be impossible to obtain muck bar at $31, which has been our nominal quotation, was the assertion made a few days ago by one of the muck bar makers in this district. A day or so later a consumer mentioned an offer of eastern muck bar at that figure. This material, however, was not of best quality and we quote muck bar from $31 to $32, Pittsburgh.

Rivets, Nuts and Bolts.—As expected by the trade, nut and bolt makers advanced quotations Oct. 16 and new cards show a regular advance of 5 per cent on all products. Rivets are being firmly held at 2c and 2.10c for button head structural and cone head boiler products, respectively. Demand continues good and some tonnage is being sold for first quarter shipment at 5 per cent

above the prevailing quotations. Shipments are more deferred and some makers are four months behind. Revised quotations follow:

Rivets

Button head structural rivets, 2c; cone head boiler rivets, 2.10c.

Bolt and Nut Discounts

Carriage bolts, ⅜ x 6 inches, smaller and shorter, rolled threads, 75, 10 and 2½; cut threads, 75 and 7½; cut, 75, 10 and 2½; larger and longer, 70 and 10.

Machine bolts with hot pressed nuts, ⅜ x 4 inches, smaller and shorter, rolled, 75, 10, 10 and 2½; cut, 75, 10 and 7½; larger and longer, 70, 10 and 5.

Gimlet and cone point lag or coach screws, 80 and 10.

Hot pressed square, blank or tapped nuts, $5.80 off list; hot pressed hexagon blank or tapped, $6.40.

Cold pressed C. & T. square, blank or tapped, $5.80 off; hexagon, blank or tapped, ⅝-inch and larger, $6.70 off; smaller than ⅝-inch, $7.30 off.

Structural Shapes.—Shapes are being held on the basis of 1.45c to 1.50c, although premiums are being paid when prompt delivery is assured. The McClintic-Marshall Construction Co. has taken a contract for 2,000 tons of steel for an extension to the open hearth department of the Republic Iron & Steel Co., Youngstown, O., reference to which was made in the Oct. 10 issue of The Iron Trade Review. Several important inquiries are pending and it is probable one or two of these will be placed before the end of the week. The following quotations prevail:

Beams and channels, 15 inches and under, zees, 1.45c to 1.50c; tees, 1.50c to 1.55c; angles, from 3 to 6 inches, 1.45c to 1.55c; over 6 inches, 1.55c to 1.60c; universal and sheared, 1.45c to 1.50c.

Merchant Pipe.—New inquiries, most of which involve small tonnages, continue to come out every few days. Nearly all the leading makers are unable to promise shipments before the end of the year, and it is probable that some of the pending inquiries will be carried into 1913. The Standard Oil Co.'s inquiry for 75 miles of 16-inch pipe for Ohio shipment has not yet been closed, although it is understood a part of the tonnage has been obtained. A week ago an inquiry for 70 miles of 4-inch pipe for West Virginia shipment was announced. It has since developed that this inquiry is the accumulation of numerous small orders and does not represent a new transaction. On Friday of last week, an inquiry for 5 miles of 10-inch steel line pipe for western Pennsylvania shipment and another for 4 miles of 8-inch line pipe for Ohio shipment were received by steel pipe makers. The new card of the Reading Iron Co. has not been adopted generally. Official discounts to jobbers, subject to the usual preferential discount to the large buyers, are as follows:

Iron and Steel Pipe Basing Prices

STEEL.

	Butt.		Lap.	
	Black.	Galv.	Black.	Galv.
⅛, ¼ and ⅜ inch.	72	52	..	..
½ inch	76	66	..	..
¾ to 3 inch	79	71	..	..
2 inch	..	..	76	68
2½ to 6 inch	..	..	78	70
7 inch to 12 inch	..	..	76	66
13 to 15 inch	..	..	53	..
Extra Strong, Plain Ends.				
⅛, ¼ and ⅜ inch.	68	58	..	..
½ inch	73	67	..	..
¾ to 1½ inch	77	71	..	..
2 to 3 inch	78	72	..	..
2 inch	..	..	74	66
2½ to 4 inch	..	..	76	68
4½ to 6 inch	..	..	75	67
7 to 8 inch	..	..	68	58
9 to 12 inch	..	..	63	53
Double Extra Strong Plain Ends.				
½ inch	63	57	..	..
¾ to 1½ inch	66	60	..	..
2 to 2½ inch	68	62	..	..
2 inch	..	..	64	58
2½ to 4 inch	..	..	66	60
4½ to 6 inch	..	..	65	59
7 to 8 inch	..	..	58	48
IRON.				
¼ inch	67	51	..	..
½ inch	70	57	..	..
¾ to 1½ inch	73	62	..	..
2 and 2½ inch	74	63	..	..
2 inch	..	..	70	61
2½ to 4 inch	..	..	72	64
4½ to 6 inch	..	..	71	63
7 to 12 inch	..	..	69	56
Extra Strong Plain Ends, Card Weight.				
¼ inch	64	53	..	..
½ inch	68	61	..	..
¾ to 1½ inch	72	63	..	..
2 and 2½ inch	73	64	..	..
2 inch	..	..	67	61
2½ to 4 inch	..	..	71	64
4½ to 6 inch	..	..	70	63
7 to 8 inch	..	..	64	54
9 to 12 inch	..	..	59	48
Double Extra Strong Plain Ends, Card Weight.				
½ inch	58	50	..	..
¾ to 1½ inch	61	53	..	..
2 and 2½ inch	63	55	..	..
2 inch	..	..	56	50
2½ to 4 inch	..	..	61	55
4½ to 6 inch	..	..	60	54
7 and 8 inch	..	..	53	43

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

The above discounts are for full weight pipe, subject to a variation of 5 per cent, merchant pipe, when specified, being furnished up to 6 inches at one point higher discount (lower price).

Boiler Tubes.—The market for steel and iron boiler tubes remains the same. There is some new demand and specifying continues liberal. Premiums are paid in many instances. The following quotations, however, represent the market:

	Steel.	Iron.
1½ inch	..	..
1¾ to 2¼ inch	62	47
2½ inch	64½	52
2¾ to 3¼ inch	69½	54½
3½ to 4½ inch	72	57
5 and 6 inch	64½	..
7 to 13 inch	62	..

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire.—The new quotations offered by the Jones & Laughlin Steel Co. a week ago, which showed an advance of $1 a ton, have not been adopted by other wire manufacturers in this district, although it is not believed much tonnage for shipment next year is being accepted at less than $1.75 as the base price of wire nails. Before mills formally open books, it is probable that advanced prices will be announced. The Jones & Laughlin company is booking considerable tonnage for shipment after Jan. 1. Specifying is liberal and shipments continue heavy. The following quotations are being maintained:

Wire nails, jobbers' carload lots, $1.70 to $1.75, retailers' carload lots, $1.75 to $1.80; cut nails (western makers), jobbers' lots, $1.70; painted barb wire, jobbers' carload lots, $1.70 to $1.75; retailers' carload lots, $1.75 to $1.80, with 40c for galvanizing; plain wire to jobbers in carloads, $1.50 to $1.55; and to dealers, in carloads, $1.55 to $1.60; polished staples, $1.70 to $1.75; galvanized staples, $2.10.

Wire Rods.—The leading interest is quoting $29 on both open-hearth and Bessemer wire rods, and is refusing to shade this figure. Some of the independent mills, however, have sold fairly heavy tonnages at $28 the last few days and we continue to quote both grades at from $28 to $29, Pittsburgh.

Coke.—Prompt furnace coke has advanced so rapidly the last four weeks, consumers in all parts of the country are gravely concerned. One of the most cautious buyers in the district paid $3.85, ovens, for 10 cars of prompt furnace fuel the first of the week, and it is understood another consumer has sent a representative into the coke regions with instructions to hasten shipments and buy all the $4 fuel available. Considerable tonnage has sold at $4, and this is the minimum quotation offered by sellers and manufacturers. It was learned today that about 10,000 tons of 48-hour coke, for shipment next year, sold at $2.50, ovens, 10 days or more ago. Manufacturers are now quoting $3.25 and $3.50, ovens, on contract fuel. New inquiry for next year's coke involves about 25,000 tons. Foundry coke has been less active, but strong. Prompt foundry coke has sold at $4, and sellers are asking as high as $4.50. The labor situation in the coke regions is acute. Many employes have left the ovens to work on state roads. The Connellsville *Courier*, for the week ending Oct. 12 says production fell off 694 tons as compared with the week before, the bulk of the decrease being on the part of merchant ovens. Shipments decreased 127 cars. Revised quotations are as follows:

Connellsville furnace	$3.75 to 4.00
Connellsville furnace contract	2.75
Connellsville foundry	4.00
Connellsville foundry contract	3.50 to 3.75

Old Material.—The market for heavy melting steel is not so excited

as it was a few days ago, although no weakness has developed. This stock is being held firmly at $16, and some dealers are quoting 50 cents above this figure. At least one dealer has paid $16 for a small tonnage of high grade material. Several mills have willingly paid the market price for rather heavy tonnages, although some consumers have refused to do so. Demand for all grades has been good, but heavy melting stock has commanded greatest attention. Machine shop turnings, since last Thursday, have advanced 25 cents a ton and are now quoted at $11.50 to $12 a ton. Dealers this week have been able to obtain 50 cents above the prevailing quotations of a week ago for No. 1 cast scrap. Low phosphorus has sold as high as $19. Quotations per gross ton for delivery in the Pittsburgh district are as follows:

Heavy melting scrap	$16.00
Rerolling rails	16.50 to 16.75
Malleable	14.50 to 15.00
Bundled sheet scrap	12.75 to 13.25
Iron axles	25.00 to 26.00
Old iron rails	16.50 to 16.75
Stove plate	11.00 to 11.50
No. 1 wrought scrap	15.25 to 15.75
Old car wheels	15.75 to 16.25
Low phosphorus	18.50 to 19.00
Machine shop turnings	11.50 to 12.00
Cast borings	10.25 to 10.75
No. 1 cast scrap	14.50 to 15.00

CHICAGO

Mills Filled for First Half of 1913

Office of THE IRON TRADE REVIEW, 1328 Monadnock Blk., Oct. 22.

Increasingly strong quotations in all finished lines are evident in this territory, hard steel bars bringing from 1.50c to 1.60c, and structural material from 1.63c to 1.68c. The latter material is even scarcer and it is impossible to place contracts for any delivery. The leading interest and prominent independents in this territory continue full in bars, plates and shapes for the first half. Railroad buying shows no decrease either in rails or track fastenings and the limit of the capacity in the district is being approached rapidly. Sheets are very strong, higher mill quotations prevailing. One of the distressing features of the situation is the panicky disposition displayed by consumers of finished steel who are unable to contract for material that is an absolute necessity.

Pig Iron.—Northern iron is usually quoted on a basis of $17.50, local furnaces, but some interests are still willing to shade the price to the neighborhood of $17 on very desirable tonnages. Inquiry for foundry iron is increasing materially and good inquiries for malleable have appeared. Sales aggregating 10,000 tons were made during the week by local furnaces at $17.50. The minimum for southern iron is still $14, Birmingham, for the remainder of the year and the first quarter. No quotations on second quarter iron are available unless they be submitted to the furnaces. Although strong Birmingham producers continue to quote $14.50, no iron has been reported as sold at that price. Sales totaling 4,000 tons were made during the week at that figure, including lots of 1,200, 1,000, 500 and 300 tons to Illinois melters. Inquiries include one lot of 2,000 tons and two which, while indefinite, will exceed 1,000 tons each. Inquiries for northern iron include lots of 2,000 and 1,500 tons. Considerable inquiry for spot iron has developed, both northern and southern, and while the market is very erratic, it shows unmistakable evidence of greater strength. One small lot for immediate delivery was sold recently at $15.25, Birmingham.

Charcoal iron is now quoted to this territory at $17.75 to $19.25. The lower quotations are maintained by the new furnace at Wells, Mich.

The following quotations represent the market for Chicago delivery, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnaces:

		Rest of First year, quarter.
Lake Superior Charcoal	$17.75	$18.75
Northern foundry No. 2	17.50	17.50
Southern foundry No. 2	18.35	18.35
South'n Silveries, 5 per cent sil.	19.35	.....
Jackson co. silv'r's 8 per cent..	20.40	21.00
Malleable Bessemer	17.50	17.50
Alabama basic	18.85	.....

Merchant Bars.—Bar iron continues firm at 1.50c to 1.55c, and betterments in the delivery situation which were expected in some quarters have not materialized. While a little business at 1.60c has been reported, it is inconsequential and has no material effect on the market. It is thought that the quotations on this material will not advance further until considerable business for 1913 delivery has been booked. The market is hardening, however, and increases before that time would not be surprising. Hard steel bars have advanced to 1.50c to 1.60c, as the supply in this territory is very much curtailed. Higher prices are being quoted for soft steel bars on such small lots as can be placed.

We quote, f. o. b. Chicago, as follows:

Bar iron, 1.50c, hard steel bars, rerolled, 1.50c to 1.60c; soft steel bars, bands and small shapes, 1.58c to 1.63c; hoops, 1.58c to 1.63c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting 60 per cent off list for carload lots, 55 per cent off for less than carloads.

On iron and steel from local stock we quote as follows:

Bar iron, 1.95c per pound base; soft steel bars, 1.95c per pound base; soft steel hoops, 2.20c, full extras.

Structural Material.—While the contracts let during the week show some improvement, the total remains comparatively small on account of the continued difficulty of obtaining material. The mills in this territory are forced to refuse contracts for shapes for any delivery and the difficulties of the fabricators are increasing. It is said that some contracts have been taken which cannot be completed until the second half of next year. Store prices on shapes are much stronger, although stock shortages have helped the delivery situation. The total of structural contracts for the week is 2,906 tons, of which the leading interest has taken 305 tons from the Middle West Utilities Co. for a power station at Kincaid, Ill., and 180 tons from the International Smelting & Refining Co. for building purposes at Tooele, Utah. The Minneapolis Steel & Machinery Co. has taken 800 tons from the Great Northern Railway Co., for the Hennepin avenue bridge at Minneapolis; the Wisconsin Bridge & Iron Co. has taken 352 tons from the Minneapolis, St. Paul & Sault Ste. Marie Railroad Co. for a draw bridge over the St.

Croix river, and the Wendnagel Construction Co. has taken 128 tons from the Raymond Bros. Impact Pulverizing Co. for a building at Chicago. The Union Foundry Co. has taken 213 tons from the West Chicago park commissioners for field house No. 5, and Noelke-Richards have taken 768 tons for the Wisconsin hotel, Milwaukee, Wis. The Southern Pacific Railway Co. has let a contract for 160 tons of galvanized bracket rods and arms.

We quote, f. o. b. Chicago, as follows:

Beams and channels, 15 inch and under, 1.63c to 1.68c. For extras, see Pittsburgh report.

Store prices are as follows:

All angles, 3 inches and larger, including 6 inches, $2.05 per 100 pounds; angles over 6 inches, $2.15 per 100 pounds. base; beams, 3 to 15 inches, inclusive, $2.05 per 100 pounds, base; channels, 3 inches and larger, $2.05 per 100 pounds, base.

Rails and Track Fastenings.—Heavy rail buying by western roads continues. The bulk of the orders is being placed with the Illinois Steel Co., and some smaller lots are going to eastern mills. Specifications for track fastenings are very heavy and it is estimated that it will not be long before the capacity for both rails and track fastenings will be exhausted. Prices are very firm. The Pere Marquette has ordered 15,000 tons of rails from the Illinois Steel Co. and the Louisville & Nashville has ordered 90,000 tons, including 20,000 tons of seconds from the Tennessee Coal, Iron & Railroad Co.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 25 to 45-pound, 1.30c; 16 to 20-pound, 1.35c; 12-pound, 1.40c; 8-pound, 1.50c.

Light section relayers, 45 pounds and under, subject to inspection, $22 to $24; standard section relaying rails, subject to inspection, $23 to $24.

Track fastenings, f. o. b. Joliet, angle bars 1.50c; railroad spikes, 1.90c; smaller size spikes, 1.70c base; track bolts with square nuts, 2.25c to 2.30c.

Plates.—There have been no new developments in this material during the week, the more prominent independents and the leading interest remaining out of the market. Active car buying continues in spite of the fact that orders placed at this time have no assurance of completion before next summer. One order placed recently, for 2,000 cars, cannot be delivered until next August. The Chicago, Burlington & Quincy has ordered 500 flat cars from the Haskell & Barker Car Co.

We quote, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6⅝ to 100 inches wide, 1.63c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, $2.05.

Bolts, Nuts and Rivets.—Structural rivets are stronger, having been advanced during the week to 2.08c to 2.18c. Bolts and nuts are very firm at current quotations and increasing demand is reported from all quarters.

We quote, f. o. b. Chicago, as follows:

Rivets

Structural rivets, ¾ to 1¼ inches, 2.08c to 2.18c. base, Chicago, in carload lots; boiler rivets, 0.10c additional.

Bolt and Nut Discounts

Carriage bolts up to ⅝ x 6 inches, rolled thread, 75-10-7½; larger sizes, 75-10.

Machine bolts, up to ⅝ x 4 inches, rolled thread, 75-10-10-2½; cut thread 75-10-7½; larger sizes, 75-10-5.

Hot pressed nuts, square head, $5.85 off per cwt.; hexagon, $6.50 off per cwt.

Sheets.—One of the leading independent producers in this district reports that the tonnage of sheets remaining available for first half delivery is very small and that it is a question of but a very short time until the mills will be sold up for that period. Prices are being maintained without difficulty, and high quotations on spelter are still interfering with the production of galvanized sheets. As in other lines, store prices are increasingly strong.

We quote, f. o. b. Chicago, as follows:

Blue annealed, No. 10, 2.15c; No. 12, 2.20c. Box annealed, No. 28, 2.70c. Galvanized No. 28, 3.95c.

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

Wire Products.—Independent producers in this territory have advanced the prices of wire products to $1.75, Pittsburgh base, and are having no difficulty in obtaining business at that figure. Orders are not being actively solicited, however, and the leading interest continues to be in a position to supply the bulk of the demand.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.88; retailers' carload lots, $1.93, retailers' less than carload lots, $1.98; painted barb wire, jobbers' carload lots, $1.88; retailers' carload lots, $1.93; retailers' less than carload lots, $1.98, with 40c for galvanizing; plain wire, jobbers' carload lots, $1.68; retailers' carload lots, $1.73.

Merchant Pipe and Tubes.—Heavy specifications from both jobbers and consumers continue and although the makers in this territory have caught up with deliveries to some extent, considerable difficulty is still being experienced. Quotations are strong and further advances are expected.

We quote store prices on merchant pipe and tubes as follows:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
Butt.				
⅛ inch and ¼ inch.	69.2	48.2	62.2	41.2
⅜ inch	73.2	62.2	67.2	51.2
½ inch to 1½ inch.	76.2	67.2	70.2	58.2
Lap.				
2 inch	73.2	64.2	67.2	57.2
4½ inch to 6 inch..	75.2	66.2	68.2	59.2
Card Weight.				
7 inch to 12 inch...	72.2	61.2	66.2	55.2
Extra Strong Plain Ends.				
Butt.				
⅛, ¼, ⅜ inch.....	64.2	52.2	59.2	47.2
½ inch	69.2	57.2	64.2	52.2
2 inch to 3 inch....	74.2	62.2	....	....
Lap.				
2 inch	70.2	58.2	65.2	53.2
7 inch to 8 inch....	64.2	52.2	59.2	47.2
Double Extra Strong.				
Butt.				
½ inch	57.2	45.2	....	....
¾ inch to 1½ inch	63.2	48.2	....	....
Lap.				
2 inch	58.2	46.2	....	....
4½ inch to 6 inch..	59.2	47.2	....	....
7 inch to 8 inch....	52.2	40.2	....	....

Tubes.

	Lap weld steel.	Charcoal iron.	Shelby seamless.
	Per cent.	Per cent.	Per cent.
1 inch	37	..	55½
1¼ to 2¼ inch.....	53	38	34
2¾ to 3¼ inch.....	63	48	44
3½ to 4½ inch.....	65½	48	44
5 to 6 inch.....	53	..	..

Cast Iron Pipe.—A good number of specifications for small lots have been received by the makers during the week, but no large tonnages are evident. Prices show a tendency toward an early advance consistent with the increasing quotations on pig iron. One large municipality is seriously considering the advisability of covering for its requirements now, as conditions seem to indicate the higher prices will rule in the future.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $30, 6 to 12 inches, $28, larger sizes, $27; gas pipe, $1 a ton higher.

Old Material.—A decided softening of the prices of old material has become evident during the past week and dealers are now anxious to dispose of stocks on hand. The stocks in the hands of the large consumers are now sufficient to run from two to four months and there is no disposition to buy at the high levels. Dealers who have been bidding up the market and realizing good profits are unable to find buyers at the higher quotations, as consumers are disposed to await developments and deal-

ers are not inclined to pay high prices without good prospects of sales. It is not thought, however, that any great slump in the market will occur on account of the strong position of finished lines. But it is probable that lower quotations will rule and that the market will relapse to a fair level. The falling off of quotations at this time is largely due to the immense amount of scrap that has been brought out by high prices. The railroads are still unable to bring in their scrap on account of the scarcity of both labor and cars. A list has been issued by the Chicago, Milwaukee & St. Paul Railway Co. consisting of 842 tons of mixed scrap, of which the principal item is 500 tons of steel rails. A small list has also been sent out by the Chicago, Burlington & Quincy.

We quote for delivery in consumers' yards, Chicago, as follows:

Gross Tons

Old car wheels	$14.75 to 15.25
Old iron rails	17.00 to 17.50
Rerolling rails (5 ft. and over)	16.25 to 16.75
Old steel rails (3 ft. and und.)	14.50 to 15.00
Frogs, switches and guards	14.25 to 14.75
Heavy melting steel	14.25 to 14.75
Shoveling steel	14.00 to 14.50

Net Tons

No. 1 R. R. wrought	$14.00 to 14.50
No. 2 R. R. wrought	13.00 to 13.50
Arch bars and transoms	17.50 to 18.00
Knuckles, couplers and springs	12.75 to 13.25
Shafting	17.00 to 17.50
Iron car axles	22.00 to 22.50
Steel car axles	18.00 to 18.50
Locomotive tires	13.50 to 14.40
Dealers forge	11.75 to 12.25
Pipe and flues	11.25 to 11.75
No. 1 cast	14.00 to 14.50
No. 1 busheling	12.25 to 12.75
No. 2 busheling	9.00 to 9.50
No. 1 boiler cut	10.50 to 11.00
Boiler punchings	13.00 to 13.50
Cast and mixed boring	8.25 to 8.50
Machine shop turnings	9.00 to 9.50
Railroad malleable	14.00 to 14.50
Agricultural malleable	12.25 to 12.75
Angle bars, splices, etc., iron	16.50 to 17.00
Angle bars steel	13.25 to 13.75
Stove plate and light cast scrap	11.00 to 11.50

CLEVELAND

Pig Iron Strong---Premiums on Finished Products

Office of THE IRON TRADE REVIEW,
Penton Bldg., Oct. 22.

Iron Ore.—The movement of iron ore from Lake Superior ranges continues at a very heavy rate and practically all of the ore is being carried in contract vessels. This month will probably make a record for October shipments. Increasing interest is being shown by furnace operators investigating the market for ore for their requirements after the opening of navigation, but there have been no definite developments as to reservations, sales or prices.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $3.75; Mesabi Bessemer, $3.50; old range non-Bessemer, $3.00; Mesabi non-Bessemer, $2.85.

Pig Iron.—Liberal sales of iron have been made within a few days at $16.50, Cleveland furnace, for delivery during the first half of next year, and the Cleveland Furnace Co. has advanced its quotation to $17, furnace, for that delivery. It has no pig iron for sale for this year's delivery. No sales have yet been reported at $17, but that quotation is in harmony with prices prevailing at Toledo, Detroit and Buffalo and it is confidently expected that $17 will be the established price very soon. For delivery during the remainder of this year and the first half of next year, we quote as follows, delivered Cleveland:

No. 1 foundry	$17.25
No. 2 foundry	16.75
No. 2 southern	$16.85 to 17.35
Bessemer	17.90
Lake Superior charcoal	19.10 to 19.75
Jackson co. 8 per cent silvery	19.55 to 20.55

Coke.—The market is strong and the supply limited. Shortage of cars continues to be a source of much annoyance. Prices are as follows:

Connellsville furnace coke, $3.75 to $4.00 for prompt delivery, and $2.75 to $3.00 on contract; Connellsville foundry coke, $4.00 for prompt, and $3.50 to $3.75 on contract.

Finished Material.—Pressure for deliveries is stronger than it has been at any time this year and mills are gradually falling further behind. The situation as to structural material is especially unfavorable for deliveries. It is very difficult to obtain promises for delivery of any shapes before July 1, 1913, except from one or two mills in eastern Pennsylvania, which are obtaining premiums for prompt deliveries. One large eastern company, which withdrew from the market last summer when other mills were rapidly filling their order books, is now able to give fairly prompt delivery on structural material. The Sarnia Bridge Co., Ltd., Sarnia, Ont., has taken 200 tons for a post office at Lethbridge, Alta.; the McClintic-Marshall Construction Co., Pittsburgh, has taken 200 tons for the National Quality Lamp Division of the General Electric Co., Cleveland. Bids for the Clark avenue bridge, Cleveland, involving about 7,500 tons, will be taken around the first of the year. Bids on the foundations will be advertised for in two weeks. The superstructure will cost between $400,000 and $500,000. It is understood that bids will soon be asked for an addition to the Pontchartrain hotel, Detroit. Additional contracts will soon be placed by the J. F. O'Rourke Construction Engineering Co., contractor for the pier construction of the Detroit - Superior viaduct. The company is now driving Nos. 3 and 4 cofferdams, and if the original plans are followed, seven more cofferdams will be built, involving from 1,500 to 1,800 tons of steel piling and 500 to 600 tons of reinforcing bars. If caissons are used on Nos. 1 and 2, as proposed, 300 to 400 tons of plates will be required. Quotations on hard steel re-rolled bars have been advanced $1 per ton, and 1.40c for carload lots and 1.45c for less than carload lots are now being quoted. On small angles made from re-rolled material, quotations have been advanced $2, and 1.50c is now being quoted. Eastern mills are quoting 1.60c on sheared and 1.65c on universal plates at their mills for western shipment. There has been extraordinary demand in Cleveland for steel bars and deliveries are delayed from 90 days to 6 months. Bar iron is very strong.

Old Material. — The demand for heavy melting steel from mills in outside districts continues to dominate the scrap market. Outside plants are buying freely of this grade, the inquiries coming largely from Sharon, Pa., Pittsburgh, Canton, O., and the valley. One dealer closed this week for 2,000 tons for a Pittsburgh mill that netted prices higher than could have been secured in this market. The supply is insufficient to meet the demand and inquiries received this week offered higher prices than those made early last week.

Foundries are buying freely of No. 1 machine cast and some are making efforts to obtain contracts covering shipments over three to six months. This is a departure from the ruling practice on this grade, as foundries have rarely sought to contract for future shipments. Dealers are reluctant to accept these contracts and believe there will be a scarcity of this grade this winter, owing to the strength of the market and to climatic conditions. Local mills are anxious to buy No. 1 busheling. Other grades are steady and prices are holding firmly. We quote, f. o. b. Cleveland, as follows:

Gross Tons.

Old iron rails	$17.75 to 18.50
Old steel rails (under 6 ft.)	15.00 to 15.50
Old steel rails (over 6 ft.)	16.00 to 16.25
Relaying rails	23.50 to 24.00
Old steel boiler plate	12.25 to 12.75
Malleable iron (railroad)	14.50 to 15.00
Steel axles	19.50 to 20.00
Axle turnings	12.50 to 13.00
Malleable iron (agricultural)	13.00 to 13.50
Heavy steel	14.50 to 15.00
Country mixed steel	13.00 to 13.50
Bundled sheet scrap	11.50 to 12.00

Net Tons.

No. 1 R. R. wrought	$15.00 to 15.50
No. 1 busheling	12.75 to 13.25
No. 1 machine cast	13.25 to 13.75
No. 1 dealers' wrought	11.50 to 12.00
Machine shop turnings	9.00 to 9.25
Pipes and flues	11.50 to 12.00
Wrought drillings	9.00 to 9.25
Cast borings	8.50 to 9.00
Stove plate	10.50 to 11.00
Wrought iron piling plate	16.00 to 16.50
Wrought iron arch bars	17.00 to 17.50

CINCINNATI

Advance in Southern Ohio Pig Iron

Office of THE IRON TRADE REVIEW, 503 Mercantile Library Bldg., Oct. 22.

Pig Iron.—There has been an advance in southern Ohio iron within the past week, and $16.50, Ironton, is now the lowest price submitted by any of the furnaces. A few sales have been made recently at $16, Ironton, but this price was quoted by the furnace before the above advance went into effect. One Hanging Rock furnace is asking $17, Ironton, for any delivery for its No. 2 foundry iron, and reports a few sales at this figure. There is a decided scarcity among southern Ohio furnaces of malleable and basic iron, the demand for both having been good recently. The above prices include delivery through the first half of next year. A little resale iron is still in evidence at $16, Ironton.

Southern iron has not changed in price, and is given at from $13.50 to $14.50, Birmingham, for spot and last quarter shipment, and from $14 to $15, Birmingham, for the first quarter of next year, the higher prices indicating that the furnaces quoting them are practically out of the market. Alabama grades are being held at nothing lower than $14, Birmingham, for any delivery, with the exception of a small lot of resale iron, which can be had at $13.50. The $13.50 furnace iron is distributed among the Tennessee makers, but one stack in that state is holding for the extreme higher prices. Virginia iron has been advanced to $16, furnace, for No. 2X, for the first quarter, and $15.50, furnace, for the second quarter.

The buying and selling movement has subsided to a marked extent, and less business has been done during the past week than for two or three months. General inquiries are still scarce, and with one or two exceptions, are mostly for small lots. This does not indicate, however, that all buyers in this territory have closed for their entire requirements, as is shown by the fact that salesmen are continually placing small orders without inquiries, and the aggregate of these amount to a fair tonnage with some of the dealers. The irregularities that usually accompany a rising market such as this has been since the latter part of last summer, are also in evidence, and sales are occasionally being made at either abnormally high or low prices on both northern and southern iron. The general quotations, however, are being as reasonably adhered to as could be expected in a competitive market, and these exceptional sales do not appear to have much effect upon them.

There is an inquiry in the market for 10,000 tons of malleable iron from St. Louis, and another for 1,000 tons from the same territory. A sale of 500 tons of this same grade has been closed with a Zanesville, O., user, and a local melter has bought 600 tons of southern No. 2 foundry iron. With freight rates $3.25 from Birmingham, and $1.20 from Ironton, we quote Cincinnati prices as follows:

Southern foundry No. 1	$17.25 to 18.00
Southern foundry No. 2	16.75 to 17.75
Southern foundry No. 3	16.25 to 16.75
Southern foundry No. 4	16.00 to 16.50
Southern gray forge	15.75 to 16.25
Mottled	15.25 to 15.75
Southern No. 1 soft	17.25 to 18.00
Southern No. 2 soft	16.75 to 17.75
Standard southern car wheel	25.75 to 26.25
Northern No. 2	17.70 to 18.20
Northern No. 3	17.20 to 17.70
Northern No. 4	16.95 to 17.45
Silveries 8 per cent silicon	19.20 to 20.20

Coke.—Contracts for about 100,000 tons of Wise county and Pocahontas furnace coke have been closed for shipment to southern consumers within the past week. Prices are fluctuatting a great deal, and show a strong tendency to go higher. The consumption at present is apparently much larger than the output, which accounts to a large extent to the uncertainty of the market. Contract coke is becoming more scarce according to some dealers, who state that as long as the ovens can sell spot coke at the present fancy prices, they do not care to hold it for future shipment. Some sales of spot furnace coke have been made as high as $4, ovens, and of foundry coke at $4.25 and $4.50, ovens. Contract prices are considerably lower. We quote below from the leading coke producing districts as follows:

Connellsville district:	Prompt shipment.	Contract second half.
Foundry coke	$4.00 to 4.50	$3.25 to 4.00
Furnace coke	3.50 to 4.00	2.75 to 3.25
Wise county district:		
Foundry coke	$3.85 to 4.50	$3.25 to 4.25
Furnace coke	3.50 to 4.00	2.85 to 3.25
Pocahontas district:		
Foundry coke	$3.75 to 4.25	$3.00 to 3.85
Furnace coke	3.25 to 4.00	2.50 to 3.25
New River:		
Foundry coke	$3.85 to 4.50	$3.25 to 4.25
Furnace coke	3.50 to 4.00	2.75 to 3.35

Finished Material.—One large maker is still holding at 1.45c, for steel bars, and 1.55c, for structurals, both Pittsburgh basis, for any delivery. Practically all of the other firms are quoting 1.40c and 1.50c, Pittsburgh, for steel bars and structurals respectively. There is not much business being done by the mills, as they are not soliciting business to any extent.

and cannot, as a rule, make satisfactory deliveries. The local sheet situation is very strong, and the local mill is still adhering to 3.45c, for galvanized No. 28 gage, and 2.30c, for black sheets No. 28, both Pittsburgh basis. The differential is 15 cents between Nos. 28 and 29, and between Nos. 22, 24 and 26. The local mill is booked to almost full capacity through to the third quarter. For other mill prices, see Pittsburgh report.

Warehouse business has improved again, and local houses are being rushed with orders. Prices are the same with the exception of those on boiler tubes, which were advanced the latter part of last week. We quote below warehouse prices, f. o. b. Cincinnati, as follows:

Steel bars, 2c base; iron bars, 1.95c base; structurals, 2.10c base; plates, ¼ inch and over, 2.10c base; sheets, blue annealed, No. 10, 2.25c. base; rivets, cone head, 2.60c, base; cold rolled shafting, 58 pepr cent discount; steel hoops, 2.10c base, full extras; boiler tubes as follows: 1½ inch, 46 per cent discount; 1¾ to 2¼ inch, 57 per cent discount; 2½ inch, 60 per cent discount; 2¾ to 3¼ inch, 65 per cent discount; 3½ to 4½ inch, 68 per cent discount; 5 to 6 inch, 60 per cent discount; soft steel cold twisted concrete bars, cut to length as follows: ¾ inch square and larger, 2.15c; ⅝ inch square and larger, 2.25c; ½ inch square and larger, 2.35c; ⅞ to ⅜ inch square and larger, 2.55c, and ¼ inch square and larger, 2.65c.

Old Material. — Scrap iron prices have again risen gradually during the past week, but the advance is not as firm as dealers would like to have it, and quotations on some grades may be lowered again within the next few days. There is not the feeling of confidence that has prevailed in the market for some time, with the possible exception of last week, and the buying and selling movement, while still fair, is not as good as it should be. This recent advance is probably the last one for some time to come, as it should take a few weeks to establish it upon a firm basis. Heavy melting scrap sold today at $13.25 per gross ton from dealers' yards, and dealers are offering from $12.50 to $12.75 per gross ton for it. A dealer recently bought some machine shop turnings at $7.75 per net ton, but $8 is the general quotation. We quote below prices dealers will pay, and also dealers' selling prices in Cincinnati and vicinity as follows:

Gross Tons

Old iron rails	$14.50 to 15.00
Old steel rerolling	12.50 to 13.00
Old iron axles	19.00 to 19.50
Heavy melting scrap	12.50 to 13.25
Relaying rails	21.75 to 22.50
Bundled sheet scrap	9.75 to 10.25

Net Tons

Old No. 1 R. R. wrought	$12.00 to 12.50
No. 1 machinery cast	12.25 to 12.75
No. 1 busheling	10.50 to 11.00
Stove plate	10.00 to 10.50
Machine shop turnings	8.00 to 8.50
Cast borings	8.50 to 9.00
Heavy turnings	8.75 to 9.25
Mixed cast	11.00 to 11.50
Malleable	8.75 to 9.25

PHILADELPHIA

Heavy Selling of Virginia Pig Iron

Office of THE IRON TRADE REVIEW,
Philadelphia, Oct. 22.

Advancing prices in raw materials as well as in finished products tell the story of a strongly maintained consuming demand in the eastern market. The mills are running full and are straining to get sufficient steel. Preparations are being made to start the idle open-hearth capacity at Sparrows Point. New business is good and specifications very heavy. Eastern makers continue to book first quarter contracts in shapes and plates at 1.60c, Pittsburgh, or 1.75c, Philadelphia. The Virginia pig iron market furnishes interesting developments, where under heavy selling, prices have gone up $1 a ton further in the week to $16, furnace, for No. 2X. The leading Virginia maker has sold fully 70,000 tons since Oct. 1 and now has bookings which much more than offset the 140,000 tons of stock carried since 1907. The nominal basic market in the east has been clarified by a round sale at $17.70, delivered. Heavy melting steel has sold at $16, delivered, and all scrap grades are strong.

Pig Iron.—Heavy selling of Virginia iron recently has been the conspicuous feature of the eastern market and the rapid advance in prices of these grades is being maintained. The Virginia Iron, Coal & Coke Co., effective today, posted the second advance of a week and for this year and first quarter is now quoting $16, furnace, for No. 2X, $15.75 for No. 2 plain, $15.50 for No. 3 and $15.25 for No. 4 and lower grades, representing a rise of 75 cents. For second quarter, the advance is only 25 cents to $15.50, furnace, for No. 2X, $15.25 for No. 2 plain, $15 for No. 3 and $14.75 for forge and lower grades. Another Virginia maker has gone to $16, furnace, for No. 2X for any delivery. These advances are the result of recent heavy orders entered which in the case of the leading Virginia maker since Oct. 1 have reached about 70,000 tons. These bookings, together with the heavy tonnage taken shortly before Oct. 1, greatly exceed the heavy stock of iron, now estimated at 140,000 tons or more, which has been on the banks of this interest since 1907. If this accumulation of iron was ever a menace to the market's strength, as it has sometimes been considered, it has ceased to be so under the present condition of the order book of this maker. In fact, shipments from this stock are now being freely made. A Delaware river pipe maker has closed for 9,000 tons of Virginia No. 3 and forge for this year and first quarter at $14.75 and $14.50, furnace, equivalent to approximately $17.15 and $16.90, respectively, delivered by water and rail. This buyer also took 15,000 tons of southern low grade iron for forward shipment. Selling of eastern Pennsylvania iron is less vigorous, but makers are heavily booked and are steadily advancing their schedules. Quotations for No. 2X are at a minimum of $17, furnace, or $17.75, Philadelphia. One maker is quoting $18, delivered. A prominent Lehigh valley producer today advanced to $17.50, furnace, or $18.25, Philadelphia, for this year, and to $17.75, furnace, or $18.50, Philadelphia, for first quarter. Central Pennsylvania makers are now uniformly quoting $17, furnace, for No. 2X. The Pennsylvania railroad is still negotiating for 2,600 to 5,200 tons of foundry and charcoal iron for first quarter. Basic iron in the east, after having been nominal in price, was defined this week by a sale of about 5,000 tons for first quarter to an eastern Pennsylvania steelmaker at $17.70, delivered, or $17, furnace. The seller has now advanced his schedule 50 cents and most sellers hold for $17.50, furnace, or $18 to $18.25, delivered. A central

Pennsylvania consumer is inquiring for 5,000 to 10,000 tons for first quarter. A sale of less than 1,000 tons of standard low phosphorus at $22.50, Philadelphia, is reported and one lot of 500 tons for eastern shipment is pending. Low phosphorus continues very strong.

We quote, delivered to consumers' plants in Philadelphia and vicinity, as follows:

Eastern Pa. No. 1X foundry	$18.25 to 18.50
Eastern Pa. No. 2X foundry	17.75 to 18.25
Eastern Pa. No. 2 plain	17.50 to 17.75
Standard gray forge	16.75 to 17.00
Basic (Eastern and Central Pa.)	17.75 to 18.25
Virginia No. 2X	18.65 to 18.80
Southern No. 2	16.50 to 17.50
Malleable	18.75 to 19.00
Low phosphorus, Philadelphia	22.50 to 23.00
(First Quarter)	
Malleable	19.00 to 19.25
Basic	17.75 to 18.25
Eastern Pa. No. 2X foundry	18.00 to 18.50
Eastern Pa. No. 2X plain	17.50 to 18.00
Virginia No. 2X	18.65 to 18.80
Low phosphorus, Phila	22.50 to 23.00

Iron and Steel Bars.—Leading makers of steel bars are sold so far ahead that in most cases present quotations are largely nominal. One middle western mill is promising deliveries in about 22 weeks. Philadelphia warehouse prices on steel bars have been raised to 2.15c or $3 advance by leading sellers. Bids go in Oct. 24 on 700 tons of steel bars for the Panama canal. Bar iron continues to manifest much strength and the minimum of prices is 1.50c, eastern mill, or 1.57½c, Philadelphia, with some producers asking 1.60c, mill. Deliveries have fallen back to four to six weeks.

We quote for delivery to consumer's plants in Philadelphia and vicinity: Steel bars at 1.55c to 1.60c, and common bar iron at 1.57½c to 1.67½c. Steel bars from store are quoted at 2.15c.

Plates and Shapes.—A leading eastern Pennsylvania maker of steel plates has put its schedule for the remainder of the year on the flat basis of 1.60c, Pittsburgh, or 1.75c, Philadelphia, for sheared plates, and $1 higher for universals. It had previously been quoting on schedules that ascended by months. For first quarter, eastern makers are now quoting more openly 1.60c, Pittsburgh, and one lot of 3,000 tons for first quarter was booked at 1.65c, Pittsburgh. Eastern makers are still booking heavily in plates. In shapes, eastern mills are quoting 1.50c to 1.60c, Pittsburgh, or 1.65c to 1.75c, Philadelphia. One maker is quoting 1.75c, eastern mill. Pittsburgh district makers continue to quote plates and shapes on a minimum of 1.50c, Pittsburgh, but most of these sellers are able to take little new business. Leading warehouse interests are now quoting 2.25c, Philadelphia, on plates and shapes. Eastern makers will furnish 1,500 to 2,000 tons for two car floats for the Central of New Jersey railroad and a ferry boat which the Harlan & Hollingsworth Corporation will build.

We quote delivered to consumer's plants in Philadelphia and vicinity: Sheared steel plates, 1.65c to 1.75c; universal steel plates, 1.65c to 1.80c; structural shapes, 1.65c to 1.75c. Plates and shapes from store are quoted at 2.15c to 2.25c.

Sheets.—The leading eastern maker of sheets on Saturday advanced its price $1 a ton to a basis of 1.80c, Pittsburgh, for No. 10 blue annealed, or 1.95c, Philadelphia. New demand is strong in the east and principal producers have gotten so far behind in bookings that they are not promising deliveries in less than five to six weeks.

We quote for delivery to consumer's plants in Philadelphia and vicinity, No. 10 gage blue annealed sheets at from 1.85c to 1.90c.

Semi-Finished Steel.—The scarcity of steel has been in no wise relieved and continues to be emphasized in the higher prices paid. Open-hearth rolling billets are usually quoted at $28 to $30, eastern mill, and sales have been made up to $32, mill. Forging steel is very strong, special analysis material having been done at $40, eastern mill, on first half contracts. The run of prices for ordinary forging steel is from $34 to $36, mill. One eastern Pennsylvania manufacturer has been inquiring for 2,000 to 3,000 tons of open-hearth rolling billets. The Maryland Steel Co. is getting in readiness for early resumption, two of the furnaces of its idle open-hearth plant at Sparrows Point. An additional blast furnace is also being blown in.

We quote delivered to consumer's plants in Philadelphia and vicinity 4 x 4-inch open-hearth rolling billets at $28.50 to $30.50 and forging billets at from $34.50 to $38.50.

Cut Nails.—Leading eastern makers of cut nails are now quoting $1.85, Philadelphia, in carloads and $1.90, Philadelphia, in less than carloads. The market is very firm at these prices as makers have been booking freely.

Chains.—Prices in steel chains were again advanced $3 a ton, effective Oct. 21, to a basis of $3.40, Pittsburgh, per 100 pounds, for ⅜-inch size. The previous price of $3.25 had been established only since Sept. 23. Makers of chains have their books well filled with orders.

Coke.—Eastern iron makers are still paying some fancy prices for furnace coke for immediate or this year's shipment. Great difficulty has been encountered in getting coke even at top-notch prices. One buyer took 12,000 to 15,000 tons of standard Connellsville coke for the year, paying as high as $3.85, ovens, for some of this lot. Another consumer paid $3.75, ovens, for a small tonnage and a third $3.60, ovens. Some smelter interests in the east are reported to be paying $4, ovens, for spot 48-hour coke. Connellsville foundry coke has sold at $4, ovens, in the east and lots of Latrobe foundry have also brought the same price at points taking the full Connellsville rate. The operators show a disposition to sell only from week to week.

Old Material.—Further advances continue to emphasize the consuming demand in scrap and other melting materials at the present time. Heavy melting steel has gone 50 cents higher to $16, delivered, a round sale having been made on this level to a New Jersey consumer in the week. Some dealers are now offering up to $15.80 on steel. Continued advances in steel are indicated. No. 1 railroad wrought has been selling around $17.50, delivered, and there has been a fair movement in car wheels between $14.50 and $15, delivered. Lots of special forge have gone at slightly higher than $14.25, delivered. A quantity of San Francisco rail scrap has been offered in this market, but prices do not warrant its being brought here at present.

We quote, gross tons delivered at consumers' plants in eastern Pennsylvania and western New Jersey, as follows:

Old iron Rails	$18.00 to 18.50
Old steel rails (rerolling)	16.50 to 17.00
No. 1 heavy melting steel	15.50 to 16.00
Old car wheels	14.50 to 15.00
Old iron axles	24.00 to 25.00
Old steel axles	18.00 to 18.50
No. 1 railroad wrought	17.50 to 18.00
Wrought pipe	13.75 to 14.25
Cast borings	10.75 to 11.25
Machine shop turnings	11.00 to 11.50
Heavy cast	14.25 to 14.75
Malleable	13.25 to 13.50
Stove plate	11.00 to 11.50
No. 1 forge	14.00 to 14.25
Low phosphorus	19.00 to 19.50

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J., $1.10 to Pottsville, Pa.; Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

Death of Robert S. Groves

Robert S. Groves, who for 14 years had been the Philadelphia representative of the Worth Bros. Co., died recently after a few days illness of pneumonia, aged 69 years. He had been engaged in some branch of the steel business for about 50 years, having been associated in 1867 with Seyfert & McManus, Philadelphia, representing the Reading Iron Co. Later he was with H. W. Middleton & Co., Philadelphia iron and steel merchants, and for a time was connected with the Philadelphia office of the Lukens Iron & Steel Co.

NEW YORK

More Ore Sold---Pig Iron Strong

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg., Oct. 22.

Iron Ore.—Additional sales aggregating about 75,000 tons of Wabana, Newfoundland, ore have been made to eastern Pennsylvania furnaces for next year's shipment at the established price of 7¼ cents per unit, Philadelphia. There is only a small balance remaining unsold of the offering of Wabana ore to this country for next year. Not a great deal of ore inquiry is now pending in the eastern market for next year's delivery, but leading domestic sellers will probably soon announce their 1912 schedules, which will show substantial advances. A second sale of 18,000 tons of a well-known New York state ore to an eastern Pennsylvania furnace for next year's delivery has been made at 7¾ cents per unit, delivered.

Pig Iron.—Advancing prices in all directions continue to show the strength of pig iron conditions growing out of the heavy order books of the producers. Though the inquiry and selling is less active, the upward movement of the market is being maintained. Eastern Pennsylvania No. 2X for this year is on a minimum of $17, furnace, or $17.70, tidewater, with higher prices ruling for first quarter and first half. Some leading makers are quoting $17.50, furnace, for No. 2X, for this year and $17.75, for first quarter, one prominent Lehigh Valley interest having gone to that level the past few days. Virginia iron for this year or first quarter is up about $1 in the week by two advances of the Virginia Iron Coal & Coke Co. to a basis of $16, furnace, for No. 2X with the regular differentials for the lower grades. For second quarter, the advance has been less pronounced and this schedule is now on the basis of $15.50, furnace, for No. 2X. A leading Buffalo interest today advanced 25 cents to $17, furnace, for No. 2X, for first quarter and first half. Other makers there are closely in line and it is doubtful whether below $16.75, furnace, could now be done. The remaining supply of Buffalo No. 2X for this year is small and there is also little malleable available there or at other eastern furnaces. Hence eastern consumers of this grade are turning more actively to the valley and Cleveland districts, where quotations range from $16.50 to $17, furnace. A leading Connecticut malleable buyer is understood to have recently purchased 3,000 to 5,000 tons of this grade and an upstate consumer is now inquiring for 3,000 to 5,000 tons for any delivery. Other pending lots include 4,000 tons or more of No. 2 plain and No. 2X foundry for second quarter for a pipe maker in this district; 1,000 tons of low silicon iron for early delivery to a Connecticut buyer and a considerable assortment of smaller lots. Another large Connecticut consumer has been figuring on an indefinite tonnage of foundry grades for first half. Sales of the past week have not been heavy and have included few round lots, but sellers seem very content to book less freely under present conditions and the strength of the market is unimpaired. According to developments of the week, New England prices at inland points now range from $19 to $19.50, for No. 2X. A New Jersey buyer took 500 tons of eastern basic for shipment this year at slightly over $18, delivered. An inquiry for 3,000 tons of No. 3 southern iron for export shipment to Rotterdam or Genoa is pending. We quote for prompt and last quarter shipment at New York tidewater, as follows:

Northern foundry No. 1	$18.20 to 18.45
Northern No. 2X foundry	17.70 to 18.20
Northern No. 2 plain	17.50 to 17.70
No. 2 Virginia	18.55 to 18.80
No. 2 southern foundry	18.25 to 18.50
Malleable	19.00 to 19.25
Gray forge	17.00 to 17.50

(First Quarter.)

Northern No. 2X foundry	$18.20 to 18.45
Northern 2 plain	18.00 to 18.20
No. 2X Virginia	18.80
No. 2 Southern	18.25 to 18.75

Ferro-Alloys.—Lots of ferro-manganese for early delivery continue to command advanced prices. The $65 seaboard price disappeared in the week and sales of $68, seaboard, are noted with some sellers holding as high as $75, seaboard. On forward ferro-manganese, further sales at $61 are noted. Some sellers are now holding their forward material at $63.50, seaboard. The steamer Cynthiana arrived at Philadelphia this week with a cargo of more than 1,000 tons which will relieve some present shortages. Considerable inquiry for 50 per cent ferro-silicon is current, one eastern buyer and one Ohio consumer asking for 100 tons each. Considerable carload inquiry is out.

We quote standard English 80 per cent ferro-manganese at from $68 to $70, seaboard, for early shipment and at $61, seaboard, for delivery after Jan. 1 and 50 per cent ferro-silicon on contract at $75, Pittsburgh or Philadelphia for carloads, $74, for larger lots, and $73, for 600 tons or more. For this year, the 50 per cent ferro-silicon schedule is $2.50 less.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. is the low bidder on 3,000 to 4,000 tons of pipe for Newark, N. J. It quoted $23.25, delivered, for the small low pressure pipe, $22.90 for the larger low pressure pipe, and $22.40 for all the high pressure pipe. The market seems somewhat quieter, but it is very strong. Small sizes continue in the most active demand.

We quote 6-inch pipe at from $23 to $24, f. o. b. New York in carload lots.

Finished Material.—Heavy consuming demands among buyers in the metropolitan and other eastern districts remain manifest in the very active specifications on contracts that are coming to the mills. In practically all cases, maximum quantities are being specified, though there is little evidence of speculative buying. Difficulty in getting deliveries is a source of common complaint among consumers. New buying is good, but not spectacular, as the mills have ample bookings to keep them running full for many months.

Eastern makers of plates and shapes are now selling more freely for first quarter, on which their price is usually 1.60c, Pittsburgh, or 1.76c, New York. Eastern plate makers usually ask $1 higher for universal plates. The 1.50c, Pittsburgh basis on plates and shapes quoted by middle western sellers exercises little effect upon the ability of eastern makers to get orders at higher prices. It is apparent there is not a great deal of tonnage available on the 1.50c, Pittsburgh, basis. Steel bars are firm at 1.40c, Pittsburgh, or 1.56c, New York. Bar iron is going up steadily and 1.50c eastern mill or 1.55c to 1.60c,

New York, is the common minimum of eastern makers.

Structural lettings continue rather light. The Pennsylvania Steel Co. has 2,000 tons for a bridge for the Boston Elevated at Boston, and 700 tons for a bridge for the Central Railroad of New Jersey across the Raritan river at Bound Brook, N. J. It has also taken a small bridge for the New Haven. L. T. Shoemaker & Co. have taken about 700 tons for an additional terminal area in New York for the New York Central Railroad.

We quote for delivery at New York tidewater as follows:

Plain structural shapes, 1.66c to 1.76c; tank plates, 1.66c to 1.71c; steel bars, 1.56c; common iron bars, 1.55c to 1.60c; steel bars, from store, New York delivery, 2.00c; plates and shapes from store, 2.15c; extras as shown under Pittsburgh report.

Rails and Track Material.—The Harriman lines have closed for about 100,000 tons of open-hearth rails for delivery during their fiscal year of from June to June, of which 75,000 tons will be furnished by Steel Corporation mills and about 25,000 tons by the Colorado Fuel & Iron Co. These rails are principally for the Southern Pacific, Northern Pacific and western coast lines. Including the orders for early delivery, this system has recently placed a total of about 125,000 tons, and supplemental purchases later are expected to bring this to about 200,000 tons, which is much in excess of last year. In addition, the Illinois Central, an affiliated Harriman line, placed 50,000 tons for the Illinois Steel Co. for next year. The Maryland Steel Co. has taken 12,000 tons of Mayari Bessemer for the Southern Engineering Co., and 13,000 tons for the San Antonio & Aransas Pass railway. The Southern and the Seaboard Air Line are negotiating for next year's rails and the Canadian Northern is also inquiring on this side for 30,000 tons. All developments in the rail market emphasize the much heavier purchasing being done as compared with a year ago and show that the output of rails in 1913 will be of record-breaking proportions.

Coke.—A number of sales of prompt Latrobe foundry coke were made for eastern shipment in the current week at $4, ovens. In some cases, the purchasing point takes the full Connellsville freight, equivalent to $6.15, New Jersey tidewater, and $7.30, New England. Other sales have been on the regular Latrobe freight basis or 20 cents less. Stock coke for eastern shipment was sold in the week at $2.80, ovens. One large buyer is inquiring for 3,500 to 4,000 tons of foundry coke for first quarter. Spot Connellsville furnace coke was sold in several instances in the east in the week at $3.60 to $3.85, ovens. There is more or less criticism among the consuming trade, particularly in furnace coke, of what are termed the extravagant prices now ruling for prompt material.

Semi-Finished Steel.—The Buffalo interest which recently entered the market as a seller of open-hearth billets against its steel works soon to be started, is liberally disposing of its output and has booked a round tonnage already. This interest has had little trouble to sell open-hearth billets at from $28 to $29, at the mill. Special forging billets are being quoted and sold at from $36 to $38, eastern mills, and, as reported, some sales have been made at $40, mill. Forging steel of regular analysis runs from about $34 to $36, eastern mill.

Old Material.—An active demand for practically all grades of old material remains in force and new sales are liberal. Material is being attracted from storage by the higher prices and is coming out quite freely. Eastern steel works generally are not offering over $15.50, delivered, for heavy steel, but one sale for New Jersey shipment is reported at $16, delivered. No. 1 railroad wrought is now commanding about $17.50, delivered. Cast scrap is moving more briskly. We quote, gross tons, prices New York dealers will pay at tidewater, as follows:

Old car wheels	$13.25 to 13.50
Old iron axles	21.00 to 22.00
Steel axles	16.50 to 17.00
Old steel shafting	15.25 to 15.50
No. 1 heavy melting steel	13.25 to 13.50
No. 1 R. R. wrought	15.00 to 15.50
Wrought pipe	11.25 to 11.50
Cast borings	8.25 to 8.50
Machine shop turnings	8.75 to 9.00
Heavy cast	11.50 to 11.75
R. R. malleable	11.25 to 11.75
Stove plate	9.50 to 9.75
Grate bars	8.25 to 8.50

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City, and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City, and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City, and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City, and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York; to Jersey City, $1.00 from New York; to Newark, $1.10 from New York.

BUFFALO

Prices Advance and Buying Increases

Office of THE IRON TRADE REVIEW, Buffalo, Oct. 22.

Pig Iron. — Prices have again advanced, now bordering on $18 iron, with the minimum for low phosphorus and off grades firmly held at $16.50. The volume of inquiry and buying has again increased, despite the advances in prices, the placement for the week being upwards of 20,000 tons, scattered among a wide range of customers. The pressure on the furnaces continues to far exceed their capacity. Booking is now being limited to the needs of contract customers, as the stacks of the territory have but a limited amount of iron to dispose of to completely consume their output until the end of the first half of next year.

Susquehanna furnace No. 2 of Rogers, Brown & Co., Buffalo, was put in blast Oct. 17. It had been out for repairs. This plant now has all of its four stacks in operation.

The range of prices for the week, f. o. b. Buffalo, is substantially as follows:

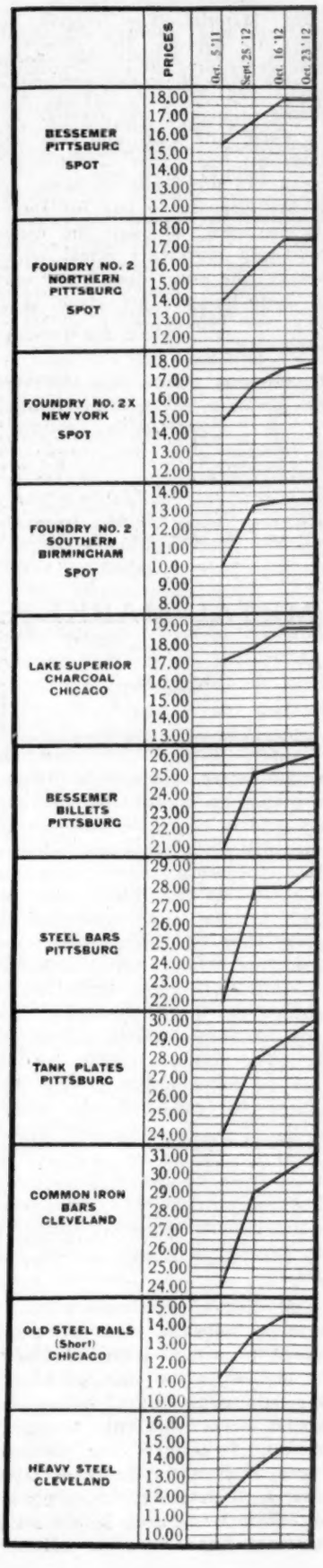
No. 1X foundry	$17.25 to 17.75
No. 2X foundry	17.00 to 17.25
No. 2 plain	17.00
No. 3 foundry	16.75 to 17.00
Gray forge	16.50 to 16.75
Malleable	17.00 to 17.50
Basic	17.50 to 18.00
*Charcoal	18.75 to 21.25
*Some grades and brands	22.00

Coke.—The market continues active at the higher prices, due to the urgent demand of the foundries to keep them from running out of fuel.

Finished Material.—Practically every mill and agency in the district is out of the selling market at this time. Inquiry has fallen off because the mills have discontinued soliciting business and are declining the voluntary tonnages offered even at prices above the market. Every energy is now devoted to getting out material under specification by contract customers, with deliveries, even under these conditions, now extended from six to eight months on most lines. There is evidence of a considerable volume of tonnage in plates, bars and shapes needed by consumers for this year's requirements which cannot be satisfied. Prices remain the same as last week, but, with the mills out of the market, these are considered merely nominal. The monthly quota clause in contracts is being generally enforced on practically all lines.

The demand for black and galvanized sheets is active even with the further advance of $2 per ton since last week. A raise of $1 a ton has been posted on blue annealed sheets, rivets, nuts and bolts. Chain has gone up $3 and a similar advance was made in cold-rolled

PRICE CHART



steel on Monday. The demand on warehouse stocks is so great that over 75 stock sizes have been completely wiped out, and deliveries extended from two to three weeks, with little prospect of getting some of the lines replenished until after the first of the year. The mills of this section are experiencing further difficulty in getting out orders on account of a shortage of cars.

Fabricators are unable to keep up to the demands of consumers, causing many new building projects to be held back.

The Buffalo Structural Co., Buffalo, got the contract for the steel in the new factory of the Cliff Paper Co., Niagara Falls, N. Y., requiring about 100 tons; also the Globe theater, Buffalo, and additions to the Gerhard Lang brewery and the Iroquois Brewing Co. plants, Buffalo, needing limited tonnages. Bids will be opened this week on work at the Pennsylvania General Electric Co.'s plant, Erie, Pa., requiring about 1,500 tons. Bids will also be opened during the week in Philadelphia for the new Bell Telephone Co.'s building, Erie, Pa.

The New York State Steel Co., Buffalo, opens its mills again, Nov. 1, to produce billets, blooms and slabs, and is accepting contracts on semi-finished material. It has placed considerable tonnage, and has a large volume of business under consideration. Prices range from $28.50 to $29, f. o. b. Buffalo.

Old Material.—The volume of trading during the week was not as heavy as last week, yet there was considerable activity in heavy melting steel, No. 1 railroad wrought scrap, car wheels, old axles and other lines, which experienced a stiffening in prices as noted below. The advance in car wheels caused a slackening of the demand from Canadian buyers. Prices are being rigidly held by the dealers and the range for gross tons, f. o. b. Buffalo, is substantially as follows:

Heavy melting steel	$14.75 to 15.25
No. 1 railroad wrought scrap	15.75 to 15.25
No. 1 R. R. and mch. cast sc'p	14.00 to 14.50
Old steel axles	16.00 to 16.75
Iron axles	23.50 to 24.00
Car wheels	15.50 to 16.25
Railroad malleable scrap	13.75 to 14.25
Wr'ght iron and soft steel turn.	8.75 to 9.00
Cast iron borings	8.00 to 8.50
Low phosphorus steel scrap	17.00 to 17.50
Old iron rails	15.50 to 16.00
Tank iron	10.75 to 11.25
Boiler plate, sheared	15.00 to 15.50
Pipe and tank	10.50 to 11.00
Stove plate	11.25 to 11.75
Sheet iron	7.75 to 8.25
Locomotive grate bars	11.75 to 12.25

ST. LOUIS

Inquiry for Round Tonnage of Basic

Office of THE IRON TRADE REVIEW,
St. Louis, Oct. 22.

Pig Iron.—The outlook for business in pig iron is decidedly bright in the St. Louis territory, but the chances of getting the iron after sales have been made are not so good. One large steel plant is asking for 15,000 tons of southern basic, and is said to be experiencing difficulty in getting a furnace to accept it for first half delivery. Prices are very firm, consumption is heavy, stocks are being reduced, and furnaces are reported to be shipping from their daily output. One plant is in the market for 500 tons of southern iron for first quarter delivery, and another for 500 tons of northern for first half shipment, and the inquiry for small tonnages is quite good. Two malleable plants bought 2,500 tons last week for last quarter delivery, one taking 1,500 tons and the other 1,000 tons. Our prices for southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow:

Southern No. 1	$18.25 to 19.25
Southern No. 2	17.75 to 18.75
Southern No. 3	17.50 to 18.50
Southern No. 4	17.25 to 18.25

Coke.—The usual run of small orders for coke keeps up remarkably well, the biggest business reported last week being a sale of 3,000 tons of Stonega coke for prompt shipment at $3.25 a ton, ovens. Coke is so hard to get that prices, while very stiff, have almost ceased to be a factor in the St. Louis territory. About the only question is "Can the coke be furnished?" Our quotations remain as follows:

We quote 72-hour Connellsville foundry grades, $4.00 for immediate shipment or delivery through the year; 48-hour Connellsville furnace, $3.50; best 72-hour Virginia foundry, $3.50; 48-hour Virginia furnace, $3.00. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Finished Material.—Steel bars are in good demand and firm at 1.40c, Pittsburgh; plates and structural material also are in good demand and prices are unchanged. Quite a lot of building is going on in the city, none of which requires a considerable tonnage of structural steel. The Monward Building Co. has about concluded to put a tower of nine stories on the new building under construction at Broadway and Olive street.

Old Material.—The rolling mills are in the market for heavy buying of

scrap iron, and dealers also are beginning to make purchases on orders placed 30 days ago. Altogether the outlook for business is very good. No lists will be put out by the railroads until about the last of the month. Prices which dealers are willing to pay, f. o. b. St. Louis, follow:

Gross Tons.

Old car wheels	$15.50 to 16.00
Old iron rails	15.50 to 16.00
Rerolling rails (5 ft. and over)	14.50 to 15.00
Old steel rails (3 ft. and und.)	14.00 to 14.50
Light section relayers (45 lbs. and under, subject to inspec.)	24.00 to 25.00
Relaying rails, subject to insp.	24.00 to 25.00
Frogs, switches and guards cut apart	14.00 to 14.50
Heavy melting steel	14.00 to 14.25
Shoveling steel	13.00 to 13.50

Net Tons.

No. 1 railroad wrought	$13.00 to 13.50
No. 2 railroad wrought	12.50 to 13.00
Arch bars and transoms	15.50 to 16.00
Knuckles, couplers and springs	12.50 to 12.75
Shafting	17.00 to 17.50
Iron car axles	20.00 to 21.00
Steel car axles	17.50 to 18.00
Locomotive tires	13.50 to 14.00
Pipes and flues	9.50 to 10.00
Tank iron and cut boilers	9.00 to 9.50
No. 1 cut busheling	11.50 to 12.00
No. 2 cut busheling	9.50 to 10.00
Cast and mixed borings	7.25 to 7.75
Machine shop turnings	8.75 to 9.25
Railroad malleable	12.50 to 13.00
Agricultural malleable	10.50 to 11.00
Stove plates	10.00 to 10.50
Angle splice bars (iron)	13.50 to 14.00
Angle splice bars (steel)	12.50 to 12.75

BIRMINGHAM

Advancing Prices Check Buying

Office of THE IRON TRADE REVIEW, Birmingham, Ala., Oct. 22.

Pig Iron.—Buying in this market has been effectually checked by the most recent advance in quotations, but without changing the attitude of the several producing interests. The actual sales reported in the past week do not aggregate more than 750 tons, all of which was for spot shipment. This tonnage was sold at a basis of $14.50 per ton at furnace, with a differential of 25 cents per ton for the low grades, and represented urgent requirements of favorite brands. For forward delivery a basis of $14 per ton at Birmingham obtains as the market price for deliveries prior to the beginning of the second quarter, as such figures are being quoted by one large interest in whose hands the bulk of the available tonnage remains; but notwithstanding the higher figures quoted by other producers, the $14 schedule is not yet attractive to the consuming interests. As was expected, the advance has resulted in a larger volume of inquiry from all sections of the trade, especially for second quarter requirements. This last is being submitted in definite form by the largest consumers, without having established a quotation, owing to the refusal of the furnace companies to commit themselves. It is understood that one large producer is practically out of the market for the entire first half, but such a condition is attributed to the heavy sales against the first quarter production, as no report has yet been made of strictly second quarter commitments. A feature of the situation is the continued scarcity of Nos. 3 and 4 foundry and gray forge, and the calls for delivery that are being made against all contracts. Where practicable, deliveries are being made at such a rate as to indicate the close adjustment of contracts to the requirements stipulated, or that furnace order books correctly represent the extent to which the trade has been provided. It is very significant that none of the tonnage engaged, since the first improvement in the market, has been held up, and that no tonnage has been offered for re-sale.

Following the advance in the prices for foundry iron, warm blast charcoal iron has advanced $1 to $2 per ton, with a decided improvement in the demand. One additional furnace will be blown in on this grade during this month, while the Hattie Ensley furnace of the Sloss-Sheffield Iron & Steel Co., at Sheffield, Ala., is scheduled to go in blast on foundry iron today.

The production of basic iron in this district is the same as for some months past, and while no recent sales are reported, an advance to the same extent as for foundry iron would no doubt obtain, owing to the heavy consumption at local steel mills.

The market is quiet, but no doubt firm at the following prices, per gross ton, f. o. b. cars Birmingham, viz.:

For delivery during the remainder of this year and first quarter next:

No. 1 foundry	$14.50 to 15.00
No. 2 foundry	14.00 to 14.50
No. 3 foundry	13.50 to 14.00
No. 4 foundry	13.00 to 13.50
Gray forge	12.50 to 13.00
Mottled	12.00 to 12.50
Standard basic	13.50 to 14.00
Off basic	11.00 to 11.50
Standard charcoal	24.50 to 25.00

With the exception of charcoal iron, an advance of 25c to 50c per ton would be asked over the above figures for deliveries in the last quarter.

The prices quoted, except for charcoal iron, apply to deliveries prior to the second quarter, although in certain cases it is probable that the tonnage engaged at those figures could be extended over the first half.

Old Material.—The market continues to improve and receipts at local yards are affected accordingly. Within the week a very attractive volume of inquiry was received from the north and east, and the actual movement was larger than for many weeks. In practically all cases, dealers are disposed to buy for speculative purposes, although the demand apparently represents actual requirements. The prices dealers are asking for their holdings are about as follows, per gross ton, f. o. b. cars here, viz.:

Old iron axles (light)	$15.50 to 16.00
Old steel axles (light)	13.50 to 14.00
Old iron rails	13.00 to 14.00
No. 1 R. R. wrought	12.00 to 12.50
No. 2 R. R. wrought	10.50 to 11.00
No. 1 country	8.50 to 9.00
No. 2 country	7.50 to 8.00
No. 1 machinery	10.50 to 11.00
No. 1 steel	10.00 to 10.50
Tram car wheels	9.00 to 9.50
Standard car wheels	12.00 to 12.50
Light cast and stove plate	8.50 to 9.00

METAL MARKETS

New York

Oct. 22.

Copper.—Business has been quiet the past week, and a wide difference in prices—as quoted by first hands and holders of resale lots—has prevailed and given the market an irregular appearance. Sales have been made as low as 17.40c, cash New York, by the latter, while the producers have not altered their quotations, from 17.75c, delivered 30 days, for electrolytic, and 17.87½-18c for lake. The large consuming trade shows no disposition to buy at present. The foreign market developed weakness again Monday, under liquidating sales, caused by the upheaval in the Balkans. Standard declined £1 5s to £75 5s for spot and £76 5s for three months. A further break of £1 occurred at the morning session of the London exchange, today. Copper exports since Oct. 1, are 14,661 tons.

Tin.—The London market has been decidedly bullish all week; prices were pushed to within a few shillings of the highest of the year, on Monday. Domestic prices have followed the foreign market, but only a moderate amount of business has transpired. The local market is nominally 50.25c, through November. Arrivals of tin since Oct. 1 aggregate 3,863 tons and there are 2,492 tons afloat.

LARGEST CONVENTION

Of Implement and Vehicle Men in Session at Cleveland.

With 250 members and associates present, and promise of the number reaching the record mark of 400, the nineteenth annual convention of the National Implement and Vehicle Association opened Wednesday morning, Oct. 23, at the Hotel Statler, Cleveland, and will continue over Friday. It was representative of the most prominent implement and vehicle men and allied interests in the country. Addresses and reports made sounded a tone of optimism, facts employed supporting the cheerful outlook taken. Numerous iron and steel men are in attendance, and, along with implement and vehicle representatives, have exhibits on display.

The convention was opened by President F. C. Johnson, Springfield, O., after which an invocation was pronounced. Mayor Newton D. Baker, of Cleveland, extended a happy welcome to the guests on behalf of the city. Response was made by H. M. Kinney, general manager of the Winona Wagon Co., Winona, Minn. Announcements, the president's annual address, committee appointments and reports of officers and committees completed the day's program.

In his address, an able production of facts and figures, and of general interest to the trade, President Johnson took occasion, among other things, to rap railroad tariff schedules, claiming that they contain more concealment since the creation of the Interstate Commerce Commission than before it existed. His address carried a real message. Its cheerful nature was born of the facts given, showing the healthy condition of the industrial and financial world, the prosperous condition of the association, its accomplishments and maturing plans.

The program for Thursday and Friday is as follows:

Thursday, Oct. 24, 10 a. m.

Call to order, 10 o'clock.

Address, "Fire Protection," Franklin H. Wentworth, secretary National Fire Protection Association.

Address, "The American Manufacturer and Industrial Education," by Dr. E. A. Rumley.

Afternoon Session—2 o'clock

Stereopticon lecture, "Safety," Robert J. Young, Illinois Steel Co.

Friday, Oct. 25, 10 a. m.

Call to order.

General trade conference. (All members urged to be present.)

Afternoon Session—2 o'clock

Amendments to by-laws.

Reports of committees on necrology, resolutions, and nominations.

Election of officers.

Miscellaneous and new business.

Selecting place for 1913 convention.

Adjournment.

(Meeting of new executive committee will occur immediately after the convention adjourns.)

The Cleveland committees have arranged the following entertainment features:

Wednesday afternoon. — Reception and tea for the visiting ladies at Hotel Statler, 4 p. m.

Wednesday evening.—Theater party, Opera House, 8:15 p. m. Play: "Passers-By".

After theater, luncheon will be served at Hotel Statler, Pompeiian dining room.

Thursday afternoon.—Luncheon for the ladies at Country Club, 1 p. m., with automobile ride through boulevard and parks.

Thursday evening.—Reception and ball in the grand ball room, Hotel Statler, 9 p. m.

Friday evening. — Annual banquet, Hotel Statler, 7 p. m.

FUEL OIL

Will Not Be Sold By Standard Oil Co. of Indiana.

Chicago, Oct. 22.—In advising its customers in the Chicago and Milwaukee districts that after Dec. 1 the sale of fuel oil will be discontinued, the Standard Oil Co. has made an announcement of far-reaching importance to the steel casting industry in the west. Milwaukee is the center of the crucible steel castings business and has a number of crucible foundries which depend entirely on crude oil for melting; there are also several open-hearth plants in Milwaukee using fuel oil in place of producer gas, and a similar situation exists in Chicago and the intermediate territory. The great reduction in the supply of fuel oil which will result from the withdrawal of the Standard from this field, will undoubtedly work a considerable hardship on the industries mentioned and will force extensive changes in plant equipment and operating methods. The change should prove a boon to the gas producer builders.

The reduction in the supply of fuel oil will seriously affect the steel producers as well as the foundries. The vice president of one of the largest independent steel companies in the Chicago territory, announced today that the change would necessitate the purchase and installation of 60 additional gas producers in his plant.

The Standard Oil Co. has confirmed its statements to the effect that no more fuel oil will be sold after Dec. 1. The only qualification is that customers having contracts which extend beyond Dec. 1, will be supplied until the expiration of their agreements, but no contracts will be renewed and no new contracts will be made to run beyond Dec. 1. In explanation of its action, the Standard Oil Co. states that the demand for gasoline has grown to such proportions that it can no longer afford to sell crude oil but is obliged to reserve its entire supply for refining. In other words, the oil company can make a much greater profit by refining the crude oil and selling the gasoline and other products which are obtained.

The Texas Co. and other independent oil producers will not follow the lead of the Standard at present, but are somewhat at sea as to the course they will pursue in the future regarding the sale of fuel oil. At all events the capacity of the independents in this territory is far too small to take care of the demand and the withdrawal of the Standard would inevitably result in large price advances by the few remaining producers.

Unless the Standard Oil Co. reconsiders its decision, which is not likely, a large number of foundries and steel plants in the west will be thrown back on coal, coke and producer gas for fuel in place of oil. The announcement is so recent that few of the interested companies have made any definite plans to meet the situation, but all are watching it keenly and waiting further developments. Although the announcement affects only the Standard Oil Co. of Indiana and subsidiaries operating in this territory, it is possible that similar action will be taken by other constituents of the dissolved Standard Oil Co. of New Jersey.

Serious Furnace Accident

A serious accident that attended the blowing in of the Macungie, Pa., blast furnace of the Empire Steel & Iron Co. Oct. 20 resulted in the death of Miss Katie Conrad, a spectator, and the injury of a number of others. A supply of gas which had accumulated in the pipes was ignited when the torch was applied. The explosion that followed blew out the wall of the stoves and caused the steel frame work supporting the gas mains to fall upon the spectators, killing Miss Conrad instantly. The furnace, which had not been in blast for several years and was recently improved for resumption, will be kept in further idleness several weeks by the damage.

G. F. Ahlbrandt, of the American Rolling Mills Co., Middletown, O., gave an illustrated lecture at the meeting of the Cleveland Engineering Society at Cleveland, Tuesday evening. His topic was "Ingot Iron versus Steel."

LARGE CAR ORDERS

Have Apparently Been Placed, But Details Are Guarded.

Though the builders and the railroads have not been disposed to discuss these matters very freely and have very manifestly taken pains to suppress the facts from publication, it is apparent that the recently-expected heavy car buying movement is now in full swing. Details are now gradually coming out. The Northern Pacific has placed 3,000 box and 1,500 refrigerator cars, largely with the American Car & Foundry Co., and this same builder is credited with having taken the major part of the recent order for the Chicago & Northwestern railroad, reported as 6,000 cars. A recent order for the St. Paul system, also reported as 6,000 cars, is understood to have gone in part at least to the Western Car & Foundry Co. The New York Central railroad is now in the market and well-established reports place the probable purchase of this road at 7,500 cars. The Pennsylvania railroad, as noted several times, is still negotiating for a large block, aggregating 9,000 cars. The Canadian Northern railroad is inquiring on this side for 3,000 cars.

PLANT TO RESUME

Idle Open-Hearth Plant of Maryland Steel Co. to be Fired.

Preparations are being made to fire in the near future two of the five open-hearth furnaces at the plant of the Maryland Steel Co., Sparrows Point, Md., which has been idle for several years. The output will be devoted to rails and billets. It is expected that the whole group will gradually resume as conditions justify. An additional blast furnace at Sparrows Point is also about to be put in. The open-hearth plant at Sparrows Point has a daily capacity of about 600 to 650 tons, which may be more than duplicated by duplexing. The Bessemer works have been steadily operating.

Wrought Pipe Advances

Pittsburgh, Oct. 23. (By wire.)—An independent maker of wrought iron pipe issued a revised card Oct. 22 showing advances of from $2 to $8 a ton on some of the smaller sizes. Sizes are grouped about the same as provided in the Oct. 1 card of the Reading Iron Co., Reading, Pa., but advances are sharper. Two and 2½-inch lap-weld black pipe has advanced $2 a ton in price value and a similar advance is noted on several other sizes. Three-eighths-inch galvanized pipe has been advanced $8 per ton.

RATES ON COKE

To Be Argued Before Commerce Commission Soon.

Washington, Oct. 22. — Arguments will be heard in a few days on three complaints before the Interstate Commerce Commission, in each of which are involved the reasonableness and character of the rate on coke from the Connellsville regions to practically all points in the country. The cases are the Coke Producers' Association of the Connellsville regions against the Baltimore & Ohio; the Youngstown Sheet & Tube Co. and others against the Pittsburgh & Lake Erie and others; and the Wisconsin and Inland steel companies against the Pennsylvania and the Pittsburgh & Lake Erie and all the railroads engaged in carrying coke to Chicago.

Although the records in these cases are bulky and look formidable, the cases themselves are not so. In fact, they appear extremely simple. The complaint of the Producers' association is that the rates both east and west are unjustly high and, therefore, unduly discriminatory against them and in favor of the coke from West Virginia. They further maintain that the rates are unduly discriminatory against the users of coke who do not have by-product ovens because these same railroads maintain rates on coal to Chicago at such a figure that the owners of by-product ovens are able to bring their raw product to Chicago, convert it into coke and retain a substantial advantage over those who depend upon coke from the ovens in the Connellsville region, even independent of what they realize from the sale of by-products.

The Youngstown complainants challenge the reasonableness of the rate of $1.35 to the valley. There are 17 plants or furnaces involved in that complaint and they produce, it is claimed, 50 per cent of the tonnage, the other half being produced by the United States Steel Corporation plants.

W. A. Riddell, of Erie, Pa., has been appointed assistant manager of the foundry department of the Otis Steel Co., Cleveland.

RECORD ATTENDANCE

Expected at Meeting of American Iron and Steel Institute.

A record-breaking attendance at the fall meeting of the American Iron and Steel Institute, to be held in Pittsburgh, Thursday and Friday of this week, is forecasted by present indications. To date more than 300 acceptances have been received and it is believed the final attendance will reach 325 or more. Arrangements have been made for three special cars to carry those from Now York, who will be in attendance from that city. Among those who will be in attendance at the meeting will be several representatives of the foreign iron and steel industry, including Benjamin Talbot, of the Cargo Fleet & Steel Co., Middlesbrough, England, and H. Oeking, head of the Oeking Steel Works, of Dusseldorf, Germany. Judge Gary will preside at the banquet to be given at the Hotel Schenley, Friday night. There will be no set speeches at this function and various prominent men of the iron and steel industry will be called upon to respond.

HEAVY ENLARGEMENT

Of Lackawanna Steel Output From New Talbot Furnaces.

An extensive enlargement of the open-hearth steel output of the Lackawanna Steel Co., Buffalo, will be afforded through the building of two Talbot continuous furnaces, the installation of which has just been inaugurated. Each of these furnaces has a rated capacity of 200 tons and it is expected that their operations will increase the output of the Lackawanna works by 10,000 tons of open-hearth ingots per month from each furnace or at the rate of 240,000 tons per annum. The Lackawanna Steel Co. also recently put in operation two new open-hearth furnaces of the regular stationary type.

Verdict for Pennsylvania Steel Co.

New York, Oct. 22.—The Pennsylvania Steel Co., Steelton, Pa., obtained a verdict for the full amount of its claim against the city of New York in the Queensboro bridge case. The claim, with interest for four years, amounts to $227,893.41.

The case grew out of the collapse of the Quebec bridge, which was followed by sensational statements against the integrity of the Queensboro bridge. The steel company's claim was held up.

Crucible Process for Making Steel Castings

The Milwaukee Type of Natural Draft, Oil-Fired Furnace Which is Successfully Used for Making Steel

In the statistics of the American foundry industry published in THE IRON TRADE REVIEW, Aug. 8, 1912, attention was directed to the remarkable growth of the steel casting industry during the past two years, but in this connection it was pointed out that the crucible process is almost stationary in output. From this it should not be inferred that the crucible steel casting industry is decadent, the facts being quite to the contrary. During the past few years this branch of the foundry trade has made rapid progress, not so much in the direction of increased tonnage as in greater diversity of output, covering a much wider range of work than was previously considered possible. The growth of the automobile industry and the great advances made recently in the design and capacity of agricultural machinery have created a special demand for quantities of small, intricate castings varying from a few ounces up to 80 pounds or more in weight.

To supply this demand the production of light, crucible steel castings is showing a steady increase and work is being turned out today in crucible steel that a few years ago would have taxed the ingenuity of our best malleable foundrymen. Thousands of castings weighing less than a pound apiece are now being made successfully in steel and many more weigh less than three ounces each. To the older generation of crucible steel men, such results would have been considered preposterous. Progress of this character is not reflected in tonnage statistics. Although the tonnage has changed only slightly in the past two years, the number of castings made has increased perceptibly; the average weight per casting is less and the value of the product has increased. The next biennial period will undoubtedly show further progress along the same line.

Sivyer Steel Casting Co.

Among the organizations which have been influential in bringing about this change in the character of the crucible steel casting industry, the Sivyer Steel Casting Co., of Milwaukee, is typical. Milwaukee is the center of this branch of the foundry trade, there being over a dozen crucible foundries in the city with an aggregate annual production of about 10,000 tons. It is only natural, therefore, that the progressive shops should be located in this vicinity.

The Sivyer Steel Casting Co. was organized late in 1908 and commenced operations Feb. 23, 1909, with only 11 men in a small shop adjacent to the plant of the Chain Belt Co. and Northwestern Malleable Iron Co. As it was rather difficult at that time to obtain business of the character generally considered desirable for a crucible steel foundry, the management of the new concern poached on preserves that were considered sacred to the malleable industry. With almost no experience as a guide, many practical obstacles were encountered in the shop and had to be surmounted and much pioneering was necessary. This is reflected in the early cost sheets of the organization. Gradually, however, the principles in this new field were mastered and the business grew and prospered. Today over 75 men are employed and the output reaches 125 tons of finished castings per month. The plant of the Sivyer company, therefore, ranks among the largest in its field in the country.

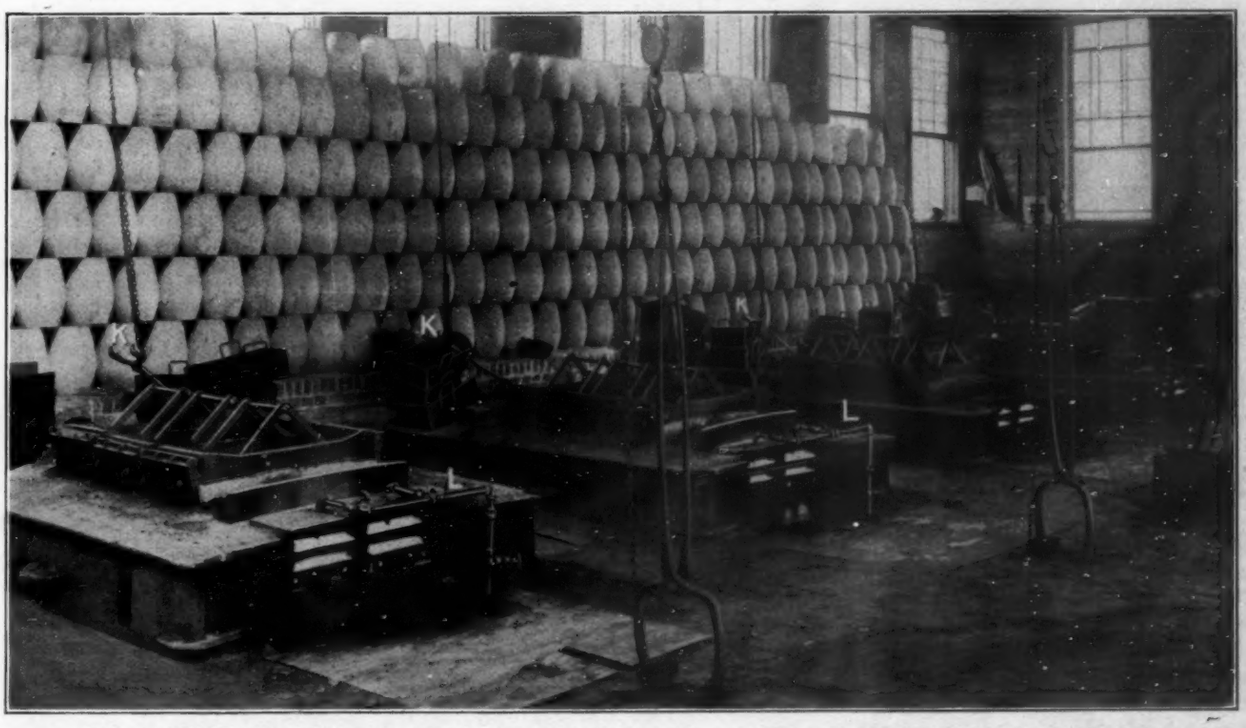


FIG. 1—IMPROVED CRUCIBLE STEEL MELTING FURNACES OF THE OIL-BURNING, MILWAUKEE TYPE

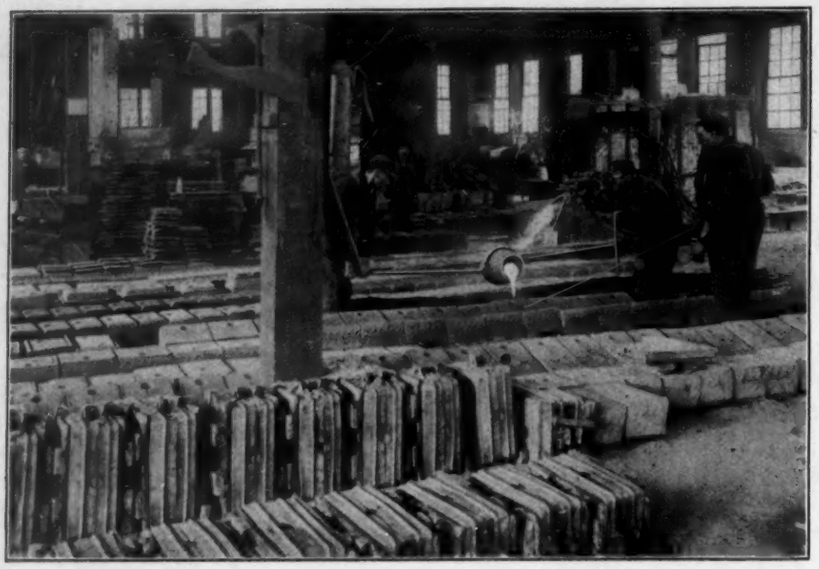


FIG. 2—TEEMING INTO MOLDS WITH UPRIGHT MOLDS IN THE FOREGROUND

The character of the work turned out is illustrated in Figs. 4 to 6, inclusive, and in Fig. 10. Recent records show that the average weight per casting is approximately 6.5 pounds, but the shop is equipped to turn out castings varying from 2½ ounces to 500 pounds each. In fact, in one or two instances, orders have been executed for castings weighing considerably less than two ounces apiece, although such jobs must be considered exceptional. But, as previously suggested, this shop specializes on light work similar in its general character to the output of the average malleable foundry. The product includes low and high carbon cast steel, plain or annealed, suitable for welding and tempering, also vanadium, titanium and other alloy steels.

Arrangement of the Shop

The plant is located in one of Milwaukee's newest manufacturing districts on the west side near National avenue and Thirty-eighth street. Ample ground has been acquired for future expansion. The altitude is high, drainage good and living conditions are superior to those found in the ordinary manufacturing suburb. The main building which houses the molding, melting, cleaning, annealing and shipping departments is 150 feet in length and 70 feet in width. It is a frame structure of the slow burning type divided by two longitudinal roof trusses and rows of columns into three bays. The south and center bays are devoted to molding; the melting and annealing departments occupy the north bay which is about 20 feet wide. The molding floor is about 130 feet long and 55 feet wide. The floor area is, therefore, 7,150 square feet; the capacity of the shop is 125 tons monthly or five tons daily; hence 1,430 square feet of molding floor are required per ton of finished castings produced daily. The molding machines are arranged under the windows along the south wall; the machines occupy only a portion of the wall space, the balance being utilized for bench molding. At the west end of the building space has been set aside for the cleaning and shipping departments. The core department is located in a small building connecting with the south side of the main foundry. The pattern and flaskmaker's shop, pattern storage and office are in a separate structure just north of the main building. The raw stock is stored in suitable bins and sheds located along the railroad track east of the shop; the fuel oil is stored in two large horizontal steel tanks having a capacity of four carloads from which it feeds by gravity into the furnaces. The plant is provided with a spur track for receiving and shipping material by rail.

Melting Furnaces

The melting department includes ten 6-pot oil-burning furnaces, Fig. 1, of the improved Milwaukee type. They are approximately 9 feet long, 5 feet wide and 6 feet deep over all and project 12 inches above the floor line. The melting chamber is 4½ feet long, 3 feet wide and 30 inches deep. There is a cleaning pit, 2½ feet wide at the front and sides of each furnace. The original Milwaukee type of furnace had a melting capacity of 1,400 pounds per day and consisted of three chambers holding a total of four pots. The first chamber was used for melting, the second, although intended for melting, was found available only for pre-heating and the third compartment was never used except for examining the flame. Although this furnace was arranged to hold six pots there were never more than two exposed to the melting heat at the same time. The average daily run was seven heats of two pots each, consuming 170 gallons of oil. The oil consumption per ton of steel melted was approximately 282 gallons. The furnace had a life of about

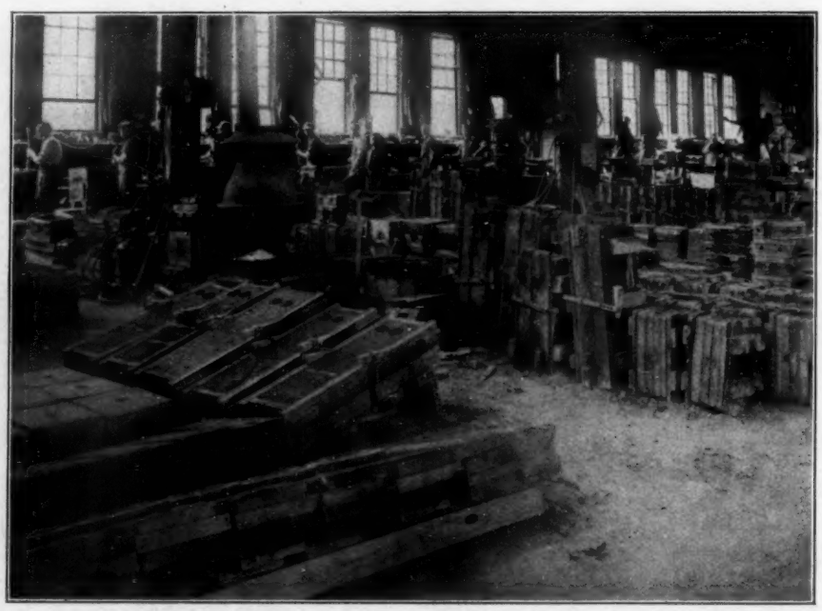


FIG. 3—EAST END OF MOLDING FLOORS, SHOWING FLASKS TILTED AND PLACED ON END FOR POURING

16 days, when the side walls and arches had to be rebuilt. The old furnace, however, was easy on crucibles, from five to six heats per pot being obtainable occasionally. Of course the charges after the third heat were greatly reduced, and the economy in crucibles was more apparent than real. Experiments showed that the cost of melting after the third heat, especially if the pot was worn away considerably, was often greater than the cost of new crucibles. This is due largely to the fact that the oil consumption for a short heat is practically as great as for a full heat, and the daily output per furnace is greatly reduced. In addition, there is always the danger of the old pot breaking in the furnace when the resultant expenditure for repairs is always greater than any possible saving that can be effected by the use of burned crucibles.

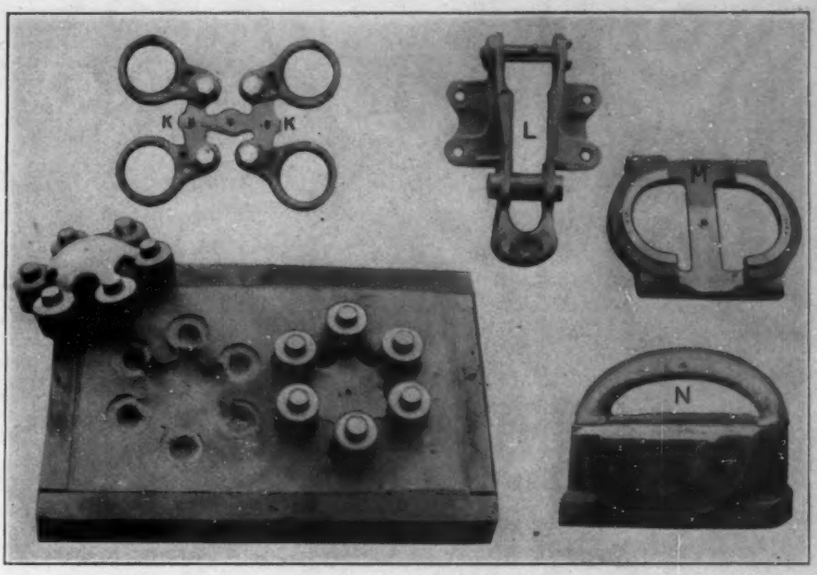


FIG. 5—ROLLER PATTERNS GATED AND MOUNTED ON A FOLLOW-BOARD. MISCELLANEOUS PATTERNS PROPERLY GATED FOR CRUCIBLE STEEL ALSO ARE SHOWN

Improved Milwaukee Furnace

The improved furnaces installed in the Sivyer foundry are the result of recent experience and represent a considerable advance over the original Milwaukee type. Instead of two bridge walls and three melting chambers, there is but a single compartment holding six pots, all of which are subjected to a melting heat. A longitudinal view and a cross-section of the improved furnace are shown in Fig. 12; cold air enters through the spaces between the pans and through the air slot, *D*, following the dotted line to the stack. The burners are of the improved Mitas type and are illustrated in Figs. 1 and 12. From the supply pipes, *L*, shown in front of each furnace in Fig. 1, the oil drops into a series of four pans equipped with overflows, which convey the oil from each pan to the one next beneath. Cold air for combustion enters at *C*, Fig. 12, and through the air slot at *D*. The damper, *F*, regulates the draft, while the iron plates shown in Fig. 1 regulate the air supply. When pulling the pots the main damper is closed and the by-pass, *G*, Fig. 12, is opened, allowing the flames to pass up the stack without entering the melting chamber. In the older type of furnace but three oil-drip pans were used in the burner. A layer of crushed coke and old crucibles is placed at the bottom of the furnace. No. 60 crucibles holding 150 pounds of metal when new are used.

There is, of course, no forced draft, the furnaces being connected to a steel stack, 100 feet high and 48 inches inside diameter. In addition to the regular main flue connecting the stack with the furnaces there is an auxiliary flue or by-pass which may be used. The auxiliary flue enters between the third and fourth furnaces, counting from the east end of the row, and the main flue between the seventh and eighth, thus dividing the battery into two groups of three and one group of four furnaces. Suitable dampers are provided so either flue may be connected to either one or both of the adjacent groups of furnaces. As a result of this arrangement it is not necessary to shut down the plant for flue repairs as is the case where there is only one flue between the stack and furnaces.

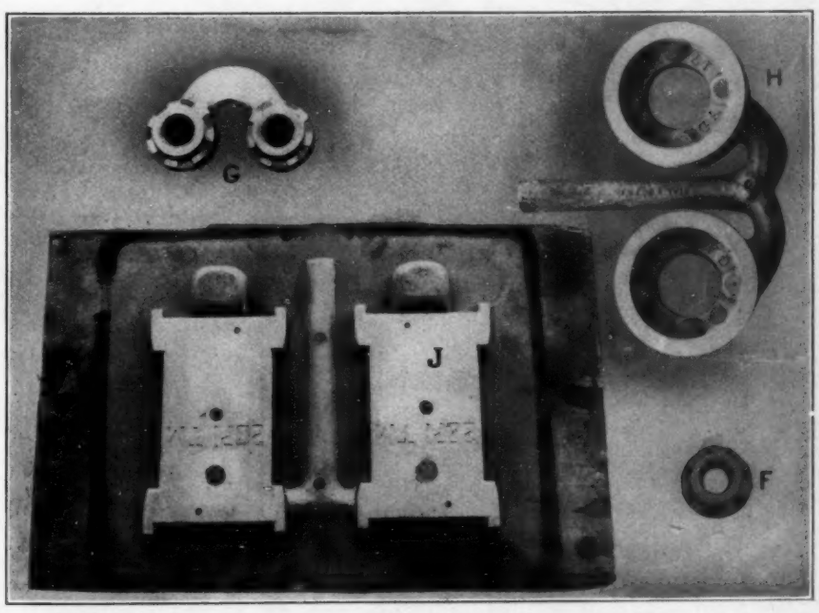


FIG. 4—PATTERNS WHICH ILLUSTRATE THE METHODS OF GATING

Life of Furnaces

These furnaces have a life of about two weeks when the side walls and arches must be rebuilt, temporary repairs being made at intermediate intervals. A second quality refractory brick is used, as the irregularity of furnace operation, only about 14 hours per day, causes the brick to spall or chip off. If the furnaces could be run continuously, a higher grade brick could be used in the lining, which would increase the life and consequently lessen the cost of production. The oil consumption is approximately 224 gallons per ton of steel melted as compared with 282 with the older style furnaces.

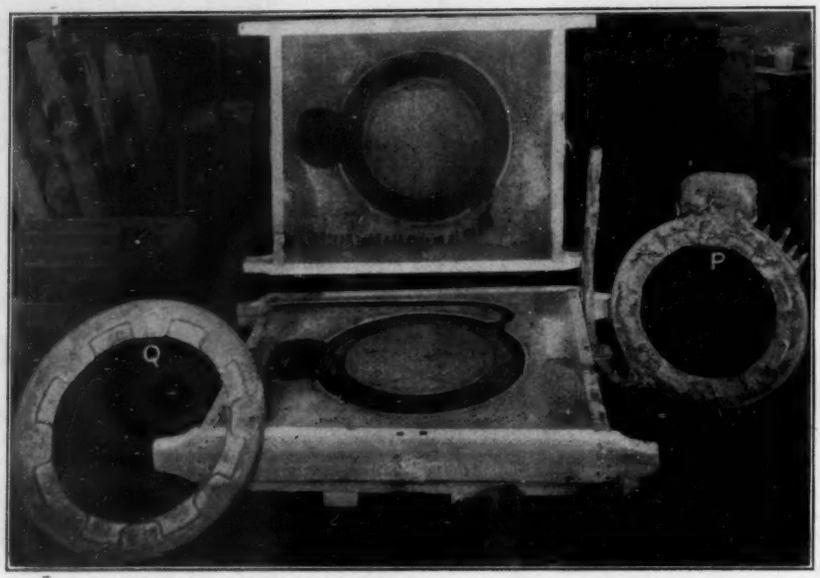


FIG. 6—A HEAVY SPROCKET WHEEL CAST IN CRUCIBLE STEEL

Each furnace has a daily capacity of 2,800 pounds of metal, or double that of the older type. The total melting capacity of the 10 furnaces in the plant is, therefore, 14 tons daily.

Operating the Furnaces

In operation, the furnaces are lighted early in the morning in order to get out the first heat at 7 a. m. About two hours are required to melt down a heat and the average life of a crucible is from three to four heats. The crucibles are stored along the wall behind the furnaces as shown in Fig. 1, where they are annealed and seasoned before being used. The crucible charges, with the exception of about 10 per cent returned sprues, consist of mild steel boiler punchings which pack well in the pots. Care is taken that the punchings run less than 0.04 per cent in phosphorus and sulphur and they generally contain from 0.25 to 0.35 per cent manganese and from 0.12 to 0.18 per cent carbon. The slight amount of silicon in the stock is practically all absorbed in the slag when the metal is melted. To increase the soundness of the castings, 80 per cent ferro-manganese and 50 per cent ferro-silicon is added in varying quantities not exceeding 1 per cent. The castings, it is claimed, have a tensile strength of from 60,000 to 65,000 pounds per square inch unannealed and about 5,000 pounds more when annealed. High carbon steel of greater strength may also be produced. The product also possesses the uniformity which characterizes crucible steel.

The tongs used for lifting the pots are illustrated in Fig. 1. They are carefully fitted to the crucible so that the distance between the handles where the chain is attached is not too great, otherwise there will be too much strain on the pot. Blocks and chain tackle, as shown in Fig. 1, are used to pull the crucible from the furnace. The tongs are fitted and the operation superintended by the melter, the tackle being handled by the helper. For removing furnace covers the levers, *K*, Fig. 1, suspended by chains from overhead trolleys, are used. The furnace covers are extra heavy, which gives them a long life and are similar in construction to the bungs over an air furnace. For teeming the metal into the molds the shank shown in Fig. 2 is used. One end has the usual handle and the other is made in the form of tongs which grip the crucible securely; the shank is made sufficiently heavy so that it will not lose its shape or become warped by the heat. This form of shank is preferred to the ordinary solid ladle shank because an extra man with a hooked rod is required in the latter case to prevent the crucible from falling out. When the crucibles are removed from the fire, the metal is skimmed and then is poured into the molds, being skimmed a second time during this operation.

Molding Practice

Molding practice differs in several particulars from that followed in gray iron and malleable foundries, on account of the peculiar nature of crucible steel. The period of fluidity is much shorter than in the case of iron and it is necessary, therefore, to provide exceptionally free-vented molds, unusually large shrink - heads and other devices to avoid blow-holes and insure sound castings. Better results are obtained when the casting is under a considerable pressure or head and when the metal rises in the mold from the bottom instead of being poured in from the top. Consequently, many molds are cast with the flasks set on end or tilted as shown in Figs. 2 and 3. Also, where possible, especially with small castings, the gates are attached at the bottom so that the metal rises in the mold and is at the same time subjected to pressure due to the hydrostatic head of the fluid metal in the runner. Heavy molds are made on the floor in the usual manner, but most of the work is done on the bench or on squeezer or jar-

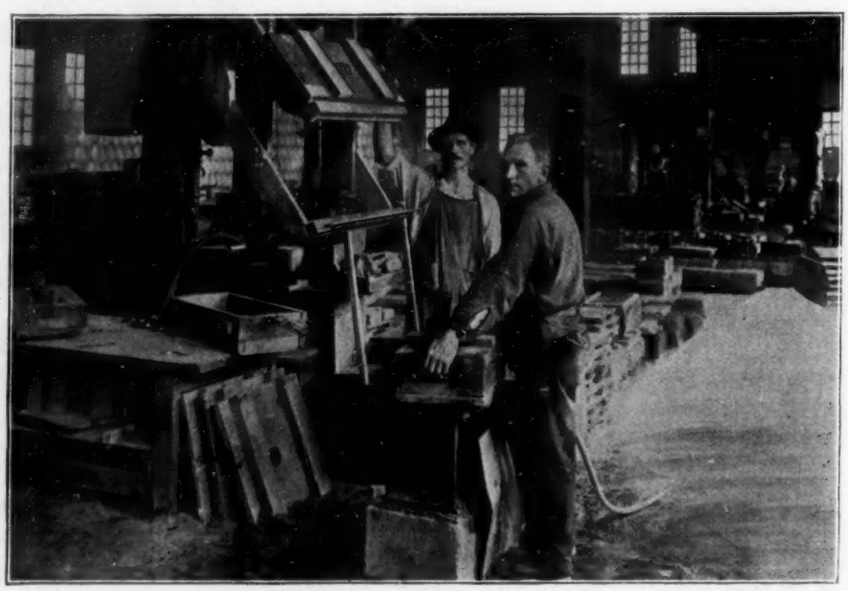


FIG. 7—JARRING MACHINE USED FOR MOLDING CONNECTING RODS. THE MOLDER IS DRAWING THE PATTERN

ring machines. These features will be discussed more in detail later.

The large flasks shown in the foreground in Fig. 3, tilted with the runners at the upper end, each contain a pair of automobile starting levers. The levers are about 30 inches long with comparatively thin sections and unless the flasks were tilted in the manner shown the molten metal would never fill the molds.

Although large numbers of wooden flasks are employed, particularly for special jobs, as fast as possible the work is being standardized and Sterling metal flasks, similar to those in the foreground in Fig. 2, are being substituted. The life of the metal flasks is much greater than that of wooden ones, especially where the molds are poured on edge through the parting. The employment of upright molding instead of flat work reduces the daily production from 15 to 20 per cent, but is preferable on account of the better results obtained. In pouring the upright molds, the metal is teemed from the ladle very slowly in order to allow sufficient time for the shrinkage action and an opportunity for the gases to escape gradually.

The Pouring Gang

Contrary to general custom, a special gang of men is employed to pour the molds and the molder does not handle any hot metal. This system has two advantages; the daily production of the molders is increased at least 20 per cent and casting losses are reduced. An average of about 100 pounds of metal per man-hour is obtained in this way.

As previously stated, a considerable portion of the output of the Sivyer Steel Casting Co. is similar to the product of a first-class malleable foundry and many of the patterns received were originally made for malleable work. Before they can be cast in crucible steel it is necessary to re-gate patterns of this type. New patterns are frequently cast in non-shrinking white metal for this purpose. Also, when plain wood patterns are furnished by the customer it is often economical to duplicate them in white metal, with suitable gates. For crucible steel work, heavy, thick gates and risers containing a large volume of metal are necessary and the gate must be full size or even slightly enlarged where it enters the mold. On small work the weight of gates and sprues will often equal and at times exceed the weight of the castings. Averaging all of the work produced in the Sivyer foundry, the heads and gates contain 28.5 per cent of the metal poured.

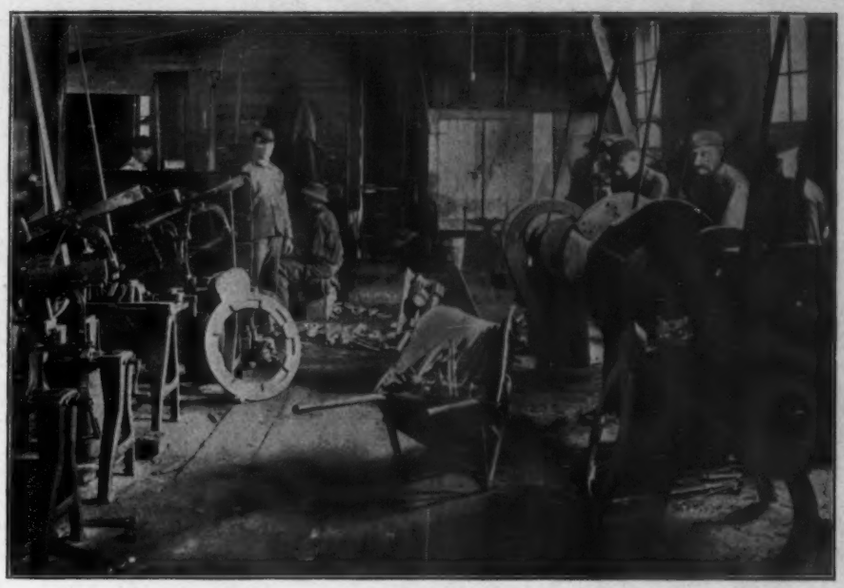


FIG. 9—A VIEW OF THE CLEANING DEPARTMENT

Figs. 4 and 5 show how the patterns are gated, provided with follow-boards and prepared for molding. At *F*, Fig. 4, is shown the original wood pattern of a small claw clutch used in an automobile. The teeth are cut to size and for pieces of this sort crucible steel is almost a necessity. A pair of white metal gated patterns ready for molding, made from the wood pattern, *F*, are shown at *G*. Each casting weighs less than a pound and the gate weighs approximately as much as the two castings to which it is attached. The gate is made extra large in this case in order to have perfectly sound, full size castings.

Method of Gating

The illustration, *H*, Fig. 4, shows how two small wheels are gated and poured in an upright position in the flask. The wheels are about 5 inches in diameter. The pattern board, *J*, shows two parts for a tractor engine arranged for vertical pouring with the gates at the bottom. It will be noted that large shrink-heads are connected to the top of each casting in order to prevent shrink holes appearing after the castings are machined.

The follow-board in Fig. 5 contains two gated metal patterns, each carrying six small rollers and the illustration shows very clearly how these patterns are mounted with a very heavy, solid, star-shaped gate. Above the follow-board at *K*, Fig. 5, is a gated pattern for molding four duplicate parts of a jack; the metal in this case enters through a central runner and is conveyed to the cast-

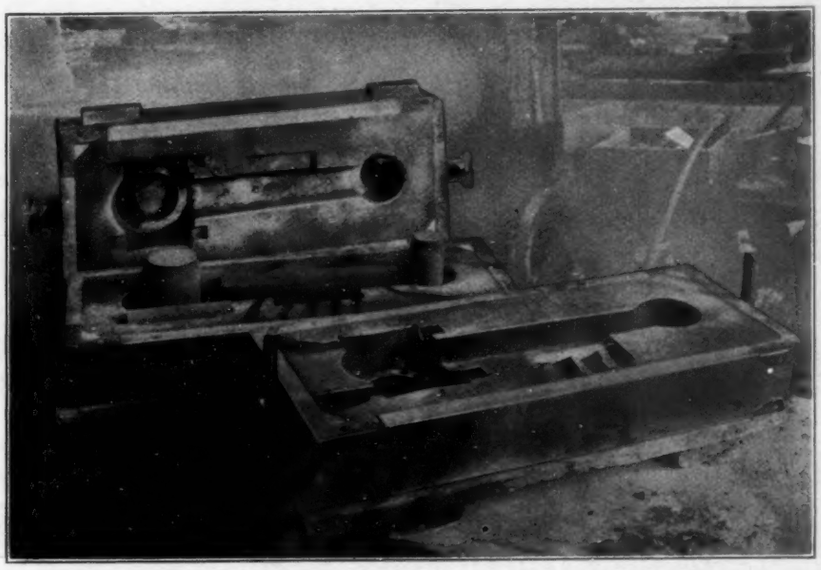


FIG. 8—CONNECTING ROD MOLD RAMMED ON A JARRING MACHINE

FIG. 10—SHIPPING DEPARTMENT, SHOWING A LARGE VARIETY OF CRUCIBLE STEEL CASTINGS

ings through a pair of double gates of large size. At *L* in the same illustration is a pattern for a crucible steel chain link, the gate in this case being at the bottom or small end. At *M*, Fig. 5, is a cap or collar used on an auto-truck and at *N* is a half pattern of a bearing; the gates used in these cases are taken from a stock of standard shapes and sizes which are kept on hand.

Heavy Floor Work

A typical example of heavy floor molding for crucible steel is illustrated in Fig. 6. The rough casting as it comes from the sand with gate and shrink-head attached is shown at *P* and the finished part, chipped and cleaned, is illustrated at *Q*. The finished casting, which is a sprocket wheel for a five-ton auto-truck, weighs 83 pounds, while in the rough it weighs 151 pounds. The gate and shrink-head, therefore, weigh 68 pounds or 45 per cent of the total. The sprocket is 27 inches in diameter with a rim 4 inches wide and 1 inch thick. It is made of steel containing 0.40 to 0.50 per cent carbon to insure good wearing qualities. The job is molded in a 40 x 48-inch wood flask which is turned on end for casting, as indicated in the illustration. Using an air rammer, a molder and helper put up 10 molds a day. A coarse, free-venting facing sand is used. For handling larger jobs than this, the shop is equipped with a 2-ton I-beam trolley provided with a triplex hoist.

Figs. 7 and 8 show how the connecting rod for a heavy gas engine is molded on a small Mumford jarring machine. The finished casting weighs 41 pounds and is molded in a snap flask 12 inches wide and 30 inches long. There are 22 nails in the mold and five cores to set. A molder and helper turn out 52 molds per day. The shop is equipped throughout with compressed air and a pneumatic vibrator is used in connection with the jarring machine for this job. Fig. 7 shows the molder applying the vibrator and drawing the pattern. The copes and drags are made alternately and matched interchangeably. Each half of the pattern is mounted on a board, the boards being hung conveniently in racks over the machine, as indicated in Fig. 7. The daily production on this and similar jobs could be increased if mechanical means for filling the flask with sand were provided. Fig. 8 shows the finished molds with cores set in the drag. Although a coarse facing is used, a number of good-sized vents are cut in the drag as shown in Fig. 8. Steel jackets are placed around the molds when they are poured to prevent runouts.

In addition to the jarring machine, the plant is equipped with five Berkshire and Adams squeezer machines provided with vibrators for drawing the pattern. These machines are arranged in a row along the south wall of the building and are used for a variety of work. Although a crucible steel casting foundry does not generally receive orders for immense quantities of duplicate castings which would justify a considerable investment in rigging nevertheless the Sivyer company has found the use of molding machines a great help in cutting down the cost of production.

Cleaning Department

A general view of the cleaning department is shown in Fig. 9. A battery of power hack saws for cutting off heads and risers, a number of large double emery grinders and other machinery such as is usually found in this department are installed. All machines are motor-driven. A complete sand-blast outfit is installed in a separate room adjacent to the cleaning department.

About 75 per cent of the work produced is annealed before shipping and for this purpose an oil-burning annealing oven has been installed. The oven is simply constructed, provided with two plain pipe burners and was erected at little expense.

FIG. 11—A VIEW OF ONE SECTION OF THE CORE ROOM

It is about 10 feet square and 8 feet high over all. The charges are annealed 24 hours. Three hours are required to bring the oven up to heat; it is allowed to remain at maximum temperature for five hours and to cool off for 16 hours. The maximum heat is about 1,900 degrees Fahr., varying of course with the nature of the work.

Shipping Department

The shipping department, which occupies the northwest corner of the main building, is illustrated in Fig. 10. It is equipped with platform scales and suitable apparatus for packing and handling castings. This illustration gives a clear idea of the variety of work turned out by the shop.

The core room, Fig. 11, is located adjacent to the south wall of the main foundry. It is approximately 40 feet long and 15 feet wide and is provided with a large shelf oven that occupies the full width of the room at one end. The oven is 7 feet high and 6 feet deep and is fitted with three sets of shelves. The firebox is at one end, with the offtake flues in the rear. About two wheelbarrow loads of coke are burned per day. The coremaking practice is similar to that found in the average good jobbing foundry.

Gradually during the 3½ years that this foundry has been in operation a simple and effective cost system has been evolved, a brief description of which will be of interest. The lack of a suitable cost system is responsible for the downfall of many otherwise successful organizations, and especially in the jobbing foundry business there is a surprising lack of information along this line. A foundryman without an accurate knowledge of his costs is hampered in more ways than one. He not only loses money on jobs unnecessarily but he loses the respect of his customers as well. Customers like to deal with men who know where they stand and can, therefore, be depended upon when the day for delivery arrives.

For purposes of cost keeping, the Sivyer foundry is divided into five departments, namely—melting, molding, cleaning, core and office. Separate detailed accounts showing the expenses, all the expenses, chargeable to each department daily are kept. The daily accounts are summarized monthly, when cost sheets showing the distribution of expense to each department are made up. In these monthly summaries the office expense, which is in reality a part of the overhead, is distributed among the other four departments in proportion to the payroll in each department. That is, if the molding department has half the total shop payroll, then half the office expense is charged to this department. The wages of the office clerks and salaries of the officers of the company are charged to office expense. In this manner the office expense is distributed fairly among the producing departments. The other items of overhead expense, such as power, light, etc., are charged directly to the proper department.

A record of the investment in each department is kept and the various fixed charges are proportioned among the departments in accordance with their respective investments. A distinction is made between fixed charges, like interest and taxes, and overhead expense, such as power and heat. In this manner a complete monthly record of the expense in each department is obtained.

Estimating Cost of Castings

The cost of castings is estimated on a basis of material and molding labor according to the following formula:

$$\text{Cost per pound} = \frac{WP + L + FL}{w}$$

where

W is the total weight of metal required for the casting.

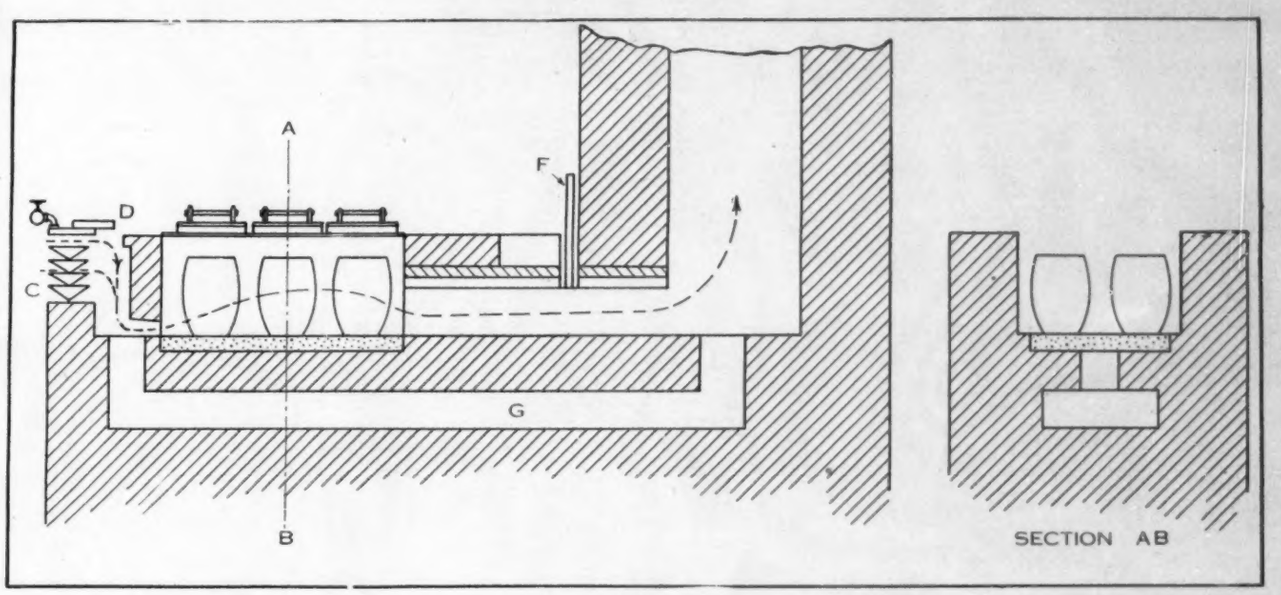


FIG. 12—LONGITUDINAL VIEW AND CROSS-SECTION OF IMPROVED MILWAUKEE TYPE CRUCIBLE STEEL MELTING FURNACE

P is the price of the metal per pound.

L is the cost of molding labor for the casting.

F is a factor which expresses all other expenses in terms of molding labor.

w is the weight of the finished casting.

The factor F is obtained from the monthly cost sheet and includes the following items, each expressed as a per cent of molding labor:

$F = N + M + I + C + O$ where

N is the non-productive molding department labor.

M is miscellaneous expense in the molding department.

I is fixed expense in the molding department.

C is cleaning department expense, which includes coremaking.

O is core department expense.

The office expense is divided among the other four departments in accord-

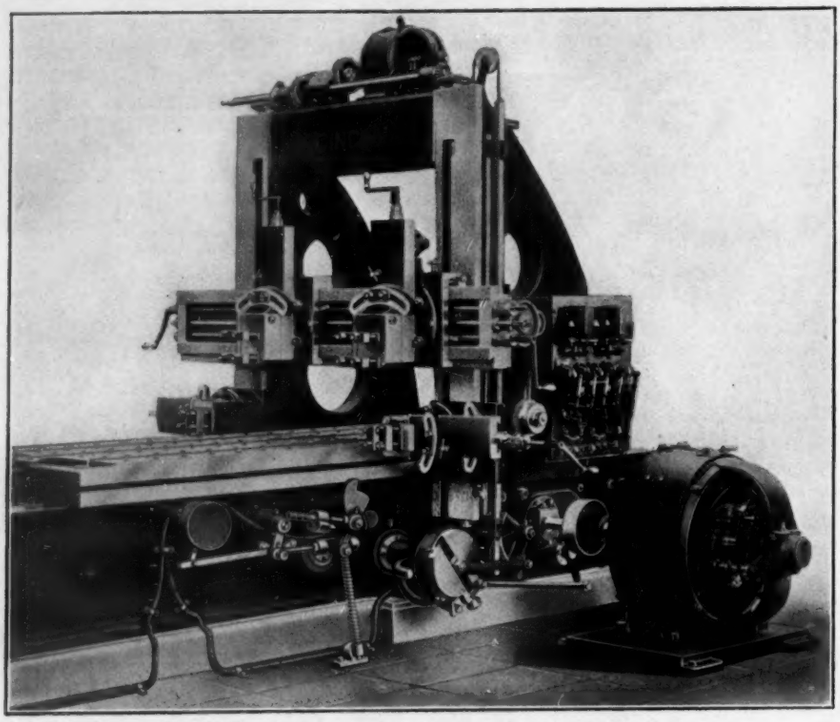


FIG. 1—DIRECT-CONNECTED MOTOR-DRIVEN PLANER

ance with their payrolls and does not appear in the formulae. The foregoing serves for most ordinary uses, but occasionally a factor involving core expense must be introduced where the casting is specially intricate.

With the factor F determined for any given month, it is a very simple matter to estimate the cost of a casting. Assume, for instance, a gear wheel weighing 70 pounds which can be molded by a man and a helper in one hour or at an expense of about 50 cents for molding labor. Assume also the cost of the metal at 4½ cents per pound and 3 as a value for the factor, F. Then the cost of the casting is found as follows:

$$\frac{WP + L + LF}{w} =$$

$$\frac{100 \times 4\frac{1}{2} + 50 + 3 \times 60}{70} =$$

9.8 cents per pound.

In this case we assume also that the weight of heads and risers is equal to 30 pounds so that the total weight rough is 100 pounds.

In common with other modern organizations, the Sivyer Steel Casting Co. is devoting considerable attention to the comfort and welfare of its men. The company buys congress shoes for the men at wholesale and sells them at absolute cost. Also, in order to militate against the evil effects of the corner saloon, milk is purchased wholesale at 2 cents per quart less than the retail rate and sold to the men at the same price for their luncheons. One day during the summer the shop is shut down for the annual picnic.

In order to encourage suggestions which will result in reduced cost of operation prizes are distributed to men who present ideas of merit. For instance a prize of $10 was awarded one of the men for suggesting a new design of brick for the furnace flue which resulted in a reduction in the brick cost. The melters are paid by the day plus a bonus for exceeding a certain tonnage. Wherever possible the molding is on a piece work basis and every effort is made to encourage production.

The officers of the Sivyer Steel Casting Co. include Frederick L. Sivyer, of the Northwestern Malleable Iron Co., president; C. R. Messinger, vice president; William C. Frye, treasurer, and Willis Collins, secretary.

Scully-Jones & Co., 316 Railway Exchange building, Chicago, have been appointed exclusive selling agents in Illinois and western Indiana of the extensive line of foundry labor-saving machinery manufactured by the Calumet Foundry Equipment Co., Harvey, Ill. In addition, Scully-Jones & Co. will represent the Calumet Foundry Equipment Co., together with other agents, in the southern, western and southwestern states.

New Form of Direct-Connected Motor Drive

A new type of direct-connected motor drive has been developed by the Triumph Electric Co., Cincinnati. In Fig. 1 is shown a motor connected by this system to a planer. The change from belt to direct motor drive on a planer involves only the removal of the overhead gears, belts, driving pulleys and the belt shifter. The motor may be coupled direct to the driving shaft or it can be connected through spur or bevel gears. A controller is bolted to the housing on the motor side, while a small reversing switch is attached to the side of the planer bed and is connected by a rod to the tumbler. The tumbler handle is replaced by a master switch.

The operation of the machine is controlled by the tumbler handle at the side of the planer. The direction of the platen is determined by the position of the tumbler, while the length of the stroke can be varied from 6 inches to the full capacity of the planer. The speed may be varied in 10 to 17 steps, according to the size of the planer, by adjusting rheostat arms on the controller panel and the planer may be stopped quickly at any point of the cycle by a slight turn of the tumbler handle. The reversal of the planer is automatic. By this system, the dynamic brake is dispensed with, as the planer is stopped and reversed by disconnecting the motor and applying reversed power.

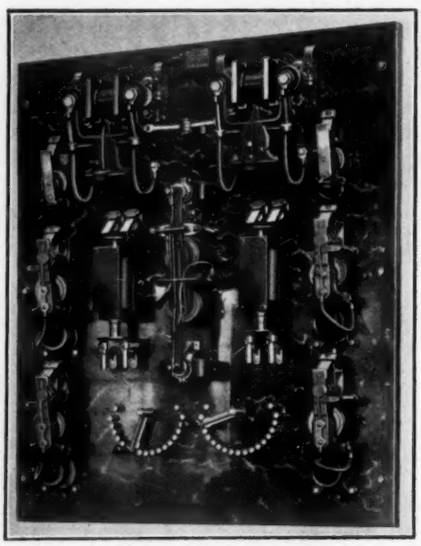


FIG. 2—THE CONTROLLER PANEL

The sequence of controller operations follows: When the master switch is turned in the on position, the current is directed into the motor armature with resistance in series. The

resistance then is short-circuited and the motor operates as a compound interpole machine with full field strength. Short-circuiting the series field converts the motor into a shunt interpole machine, still retaining full shunt field strength. The shunt resistance short-circuiting switch is then opened and causes the motor to attain its predetermined speed. When the dog throws the tumbler, all switches return to their initial positions and power is immediately applied in the reverse direction and the sequence of operations is repeated.

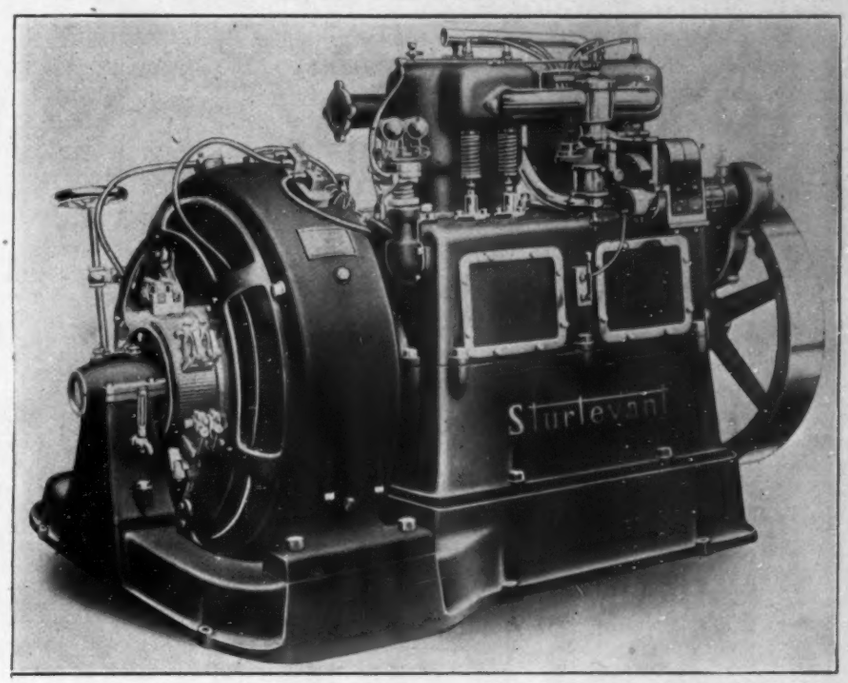
Liquid Core Binders

The J. W. Paxson Co., Philadelphia, is now manufacturing two liquid core binders, known respectively as "Pax-Oil" and "Ros-Core". The former, it is claimed, possesses all the advantages of rosin and the economies of core oils, and in addition, it prevents the absorption of moisture. Laboratory tests indicate that "Pax-Oil" makes only one-third as much visible gas as rosin when burnt. "Ros-Core" is a liquid chemically prepared for use as a binder in making large cores. It can be used to advantage for cores made of gravel or from sands which contain a bond. An attractive circular describing the merits of these two binders has been issued by the Paxson company.

Gasoline, Electric Generating Set

The electric generating set, shown in the accompanying illustration, designed for generating power in manufacturing plants, mills, hotels, etc., where an isolated unit can be operated to advantage, is manufactured by the B. F. Sturtevant Co., Hyde Park, Mass. The gas engine is of the multi-cylinder, vertical, automobile type, direct-connected to a Sturtevant electric generator and is built with four or six cylinders, according to size. The generating sets now manufactured have capacities of 5, 10 and 15 kilowatts. The cylinders of the smallest set are cast en bloc with L-shaped heads, enclosed valves and integral inlet and exhaust manifold and water jacket. The cylinders of the larger sizes are cast in pairs with integral water jackets and T heads, the valves being located on both sides. The connecting rods are made of drop forged steel and are of I section. The forged crankshafts are of large diameter and are made of 3½ per cent nickel steel. The camshafts, with integral cams, are driven by gears from the main shaft. The five-kilowatt set has one camshaft while the other sizes have two each. The base is an iron casting split in two sections on the center line of the engine. The lower part of the base contains the lubricating oil. A subbase for the engine and generator is furnished with the two larger sizes while on the small set the generator is overhung on the engine base.

A throttle governor of the centrifugal vertical type is provided. This governor permits of exceedingly close regulation, there being no noticeable fluctuation in voltage from no load to full load, thereby eliminating the necessity of operating through a storage battery as an equalizer. Forced lubrication is provided, the oil being supplied by a pump to all the bearings. The pump which circulates cooling water through the jackets is gear-driven from the crankshaft. Ignition is furnished by a Bosch magneto driven by gears from the crankshaft. No battery is necessary for starting.



THE STURTEVANT GASOLINE ELECTRIC GENERATING SET

The generator is of the direct current type and is used extensively in the United States navy in steam-driven generating sets. Both engine and generator are capable of maintaining an overload of 25 per cent for two hours.

An alloy of pure antimony with lead is now being used in the form of pipe and tubing as a conduit for carrying telephone and telegraph wires, and may entirely displace the old lead-tin compound.

Book Review

Modern Organization; by Charles DeLano Hine; 110, 5 x 7¼-inch pages; published by The Engineering Magazine Co., New York City, and furnished by THE IRON TRADE REVIEW for $2.

The chapters of this book consist of a reprint of a number of articles written by Major Hine and which appeared originally in the *Engineering Magazine*, from January to July, 1912. They constitute a definition of the author's philosophy of management. Concrete instances are cited to show the remarkable success which attended the application of these principles on the Harriman lines. Announcements have been made occasionally to the effect that certain radical changes were being effected on this railroad system, and this book shows along what lines these innovations have been instituted. The principles themselves are broad, and it is the author's contention that they can be applied to advantage in almost every line of business, the greatest difficulty encountered being the prejudice held by many firms that the peculiarities of a particular industry would not permit such management, a prejudice which, according to the author, is quite at variance with the facts.

The plant of the West End Iron Co., Lebanon, Pa., has been sold to Columbus, O., interests who will operate the chain works.

Plant for Producing Sound Ingots

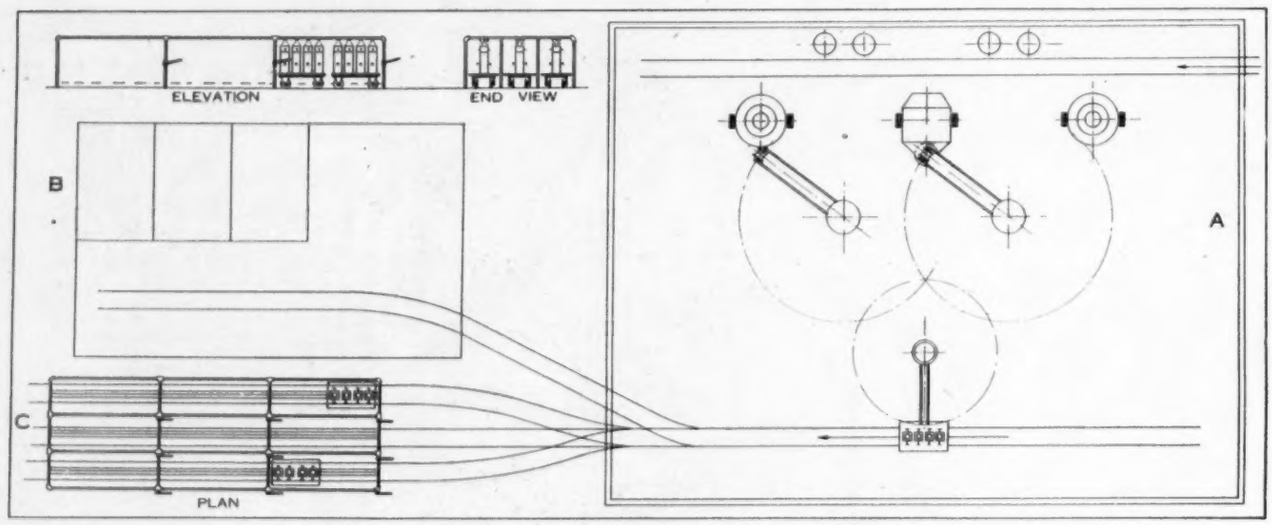
An article entitled "Effective Method of Producing Sound Ingots", by Sir Robert A. Hadfield, which appeared in THE IRON TRADE REVIEW, Oct. 3, 1912, described the Hadfield process which insures sound steel with a comparatively small waste. It is evident that in utilizing this process, a plant must be arranged with that object in view if the desired results are to be obtained with minimum cost and maximum efficiency. Such an arrangement is shown in the accompanying illustration, which represents a ground-floor plan and sectional view. The process aims to maintain the steel in the upper part of the ingot molds in a fluid condition sufficiently long to allow proper feeding of the ingots, so that piping will be largely eliminated.

One plan provides for the ingots to be cast in molds on cars or platforms, as at *A* in the plan. After four or five, or any convenient number of ingots have been cast, advantage is taken of the time that elapses during the transit of the ingots from the casting pit to the stripper, to maintain the upper surface of the steel in a molten condition. This is accomplished by three air pipes having jets on their lower surfaces, placed preferably horizontally, and arranged to cause the jets of air to impinge at a suitable distance from the upper surface of the ingots. The length of these pipes is governed by the distance traversed by the cars under them. In the elevation, the pipes extend over three rows of six cars, each car containing four ingots.

As soon as possible after the ingots are cast, charcoal is placed on the top of each ingot, together with a layer of insulating slag. The combustion of the charcoal effected by the heat of the molten steel delays the freezing of the latter, and this is aided by the air blast applied to the charcoal, which generates a considerable amount of extra heat. The layer of slag retards loss of heat and also prevents the quality of the steel being unduly affected by the latter mixing with the charcoal. By a proper arrangement of the air pipes in sections, controlled by valves or otherwise, it is possible to blow air on a line of cars extending the full length of the pipes or merely at any one section.

The time necessary for the blast to operate on the upper surface of the molds, that is, from the time they are cast until the steel is sufficiently set to avoid any danger of piping, is from 15 to 50 minutes in the case of rail ingots, according to the size of the ingot. The length of the overhead pipes can be calculated easily, when the rate of progress is known at which the ingots move from the casting pit to the stripper. The height from the track to the upper side of the runner box should be approximately the same in every case, so that the air jets will have the same heating effect on every ingot. The ingots are removed from the molds in the usual manner, preferably retaining the ingot in a vertical position during the stripping. Ingots may be cast in this way with either their large or small end at the bottom.

Another method is to cast the ingots in molds on cars to which are attached electrically-operated fans or blowers, power being obtained from overhead or underground cables. It might also be desirable to have a combination of cars operated both electrically and by overhead pipes. In the illustration, *A* represents the plan of the casting department; *B*, drying stoves for heads; *C*, general plan of air pipes or blast arrangements, shown also in the elevation. Another method would be to have the casting plant circular; the rails would be in a circular form outside the casting plant, and the cars on which the ingots were cast would operate on this track.



PLAN AND SECTIONAL VIEW, SHOWING ARRANGEMENT OF PLANT TO PRODUCE SOUND INGOTS BY THE HADFIELD PROCESS

Tungsten and Its Uses

Last year there was a sharp decrease in the production of tungsten ore owing to the decrease in the demand for tool steels, in which the bulk of the tungsten produced is used, according to Frank L. Hess, in a report on this metal, issued by the United States geological survey. The production of domestic tungsten ore in 1911 amounted to 1,139 short tons of concentrates, carrying 60 per cent of tungsten trioxide, valued at $407,985; in 1910 the production amounted to 1,821 short tons, valued at $832,092.

Tungsten is used chiefly in making steels that will hold their temper when heated, but it is most generally known as supplying the filament of tungsten incandescent lamps.

In the production of 500,000,000 tons of coal in 1911, 250,000,000 tons were wasted or left underground in such condition that it will probably not be recovered in the future, according to the Bureau of Mines.

Modern Illumination in Iron and Steel Plants[1]

The Artificial Lighting Problem Discussed by a Practical Engineer, With Examples of Good and Bad Installations

By C E Clewell

A few years ago the application of electrical energy in the iron and steel industry was limited to the use of the arc lamp and the incandescent lamp for lighting purposes. Later the electric motor was introduced and for a number of years the requirements of adequate artificial lighting were not given serious consideration. With the new interest in illumination, brought about largely by the introduction of many improved electric lamps and the appreciation on the part of mill operators of the relation of sufficient light to the output of the plant, the whole question of artificial light has been given an increased importance. It is with this new view of artificial illumination that we shall here be chiefly concerned.

Natural Light a First Consideration

The following notes relate to modern illumination in the iron and steel industry and are based on extensive tests and investigations. It has been the purpose in making these investigations to ascertain the illumination intensities which have been, and still are, in service in what may be called relatively poorly lighted locations, to study the tendencies in new lighting installations; and, finally, to observe in a general way the characteristics of the surroundings in iron and steel mill buildings, and the classes of work which must be illuminated on dark days and at night, with a view to grouping the requirements of these various locations in the matter of adequate illumination.

At the outset the importance of natural light to mill operation should be emphasized. While it is true that artificial light may be controlled with somewhat greater ease, both in the production of a uniform intensity over the floor space, as well as in certain definite quantities of light required for given classes of work, it is at the same time obviously desirable to provide adequate window space to admit sufficient natural light for the ordinary work involved. To this end the windows, where possible, should be located in such a way that the natural light is distributed in a fairly uniform manner over the entire working surface. Furthermore, the intensity of the natural light should be sufficient to remove the necessity of artificial light during the day time, thus greatly reducing the outlay for electrical energy, and at the same time making the conditions of the mill not only effective as regards the surroundings of the workmen, but more cheerful from the standpoint of humane considerations.

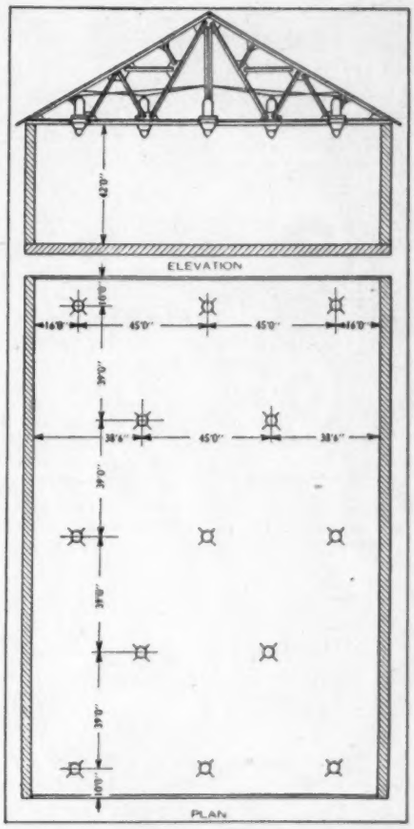


FIG. 1 — PLAN AND ELEVATION OF FOUNDRY, SHOWING USE OF LARGE LAMPS

Importance of Artificial Illumination

The question of economy as influenced by a superior environment in mill buildings, through improved workmanship and increased output, has been thoroughly discussed during the past few years. This widespread discussion has resulted in the important conclusion that efficiency in mill buildings can in general, be reduced to two factors which may be classified as that of the machinery and that of the workman.

From the operating standpoint the mill superintendent is concerned with the quantitative returns in production afforded by superior lighting facilities. He may naturally ask the question when considering an expenditure for lighting apparatus as to what return in the quantity and quality of the work is apt to result from the adoption of a superior system, involving possibly a relatively higher outlay, as compared with an inferior system, which may appear on the surface to represent a saving in first cost.

Value of Good Light

To such a general question the answer may be given that good artificial light has a definite value which may be placed either in terms of time saved to the employe in the performance of a given amount of work, or in the tonnage output which may be increased by a higher average of working efficiency brought about by improved lighting. Again, greater accuracy and perfection in the work; the avoidance of a large number of operations on defective material which has passed the inspector due to poor light; the saving of the eyes of the workmen; and the general raising of facilities for better and increased work through bright and cheerful surroundings of well-illuminated buildings, are all items which may be credited to improved lighting facilities. If, therefore, superior artificial light may be evaluated to so much time saved, or to so much increase in the tonnage output in the mill operations, the equivalent of this time saved or the increased tonnage is obviously a direct asset to a superior or improved lighting system.

Merely to indicate how these advantages work out under actual cases, it may be stated that in a number of instances the best lighting facilities have resulted in an expenditure equal to the wages of from four to six

[1]From a paper presented before the Association of Iron and Steel Electrical Engineers.

minutes per day. That is to say, superior artificial lighting represents a cost of perhaps one or two minutes of wages in excess of what inferior lighting would cost. Thus, if improved lighting effects a saving through increased output equivalent to one or two minutes wages per day, it is evident that the improved lighting has not only paid for its increased cost, but is also apt to prove itself an effective aid in improving the gross efficiency of the mill.

Electrical Items

In quite a number of iron and steel plants 220-volt, direct current circuits are exclusively used. This condition is confined in a measure to iron and steel mills and evidently produces certain peculiar limitations

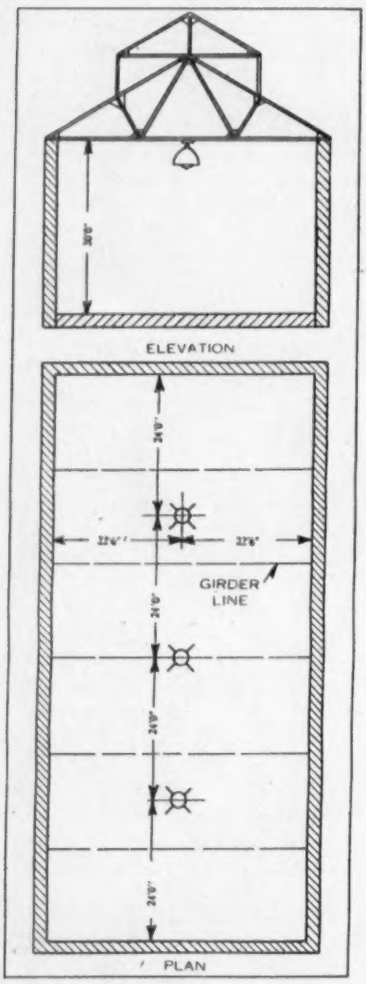


FIG. 2—ARRANGEMENT OF LAMPS OF MEDIUM SIZE IN A FOUNDRY

in the problem of artificial lighting. For example, large yards must be equipped with lamps supplied from direct current mains involving a large amount of copper for feeder circuits and relative difficulties in the arrangement of the same.

There are, however, other difficulties imposed by the limitations of supply circuits as in the selection of

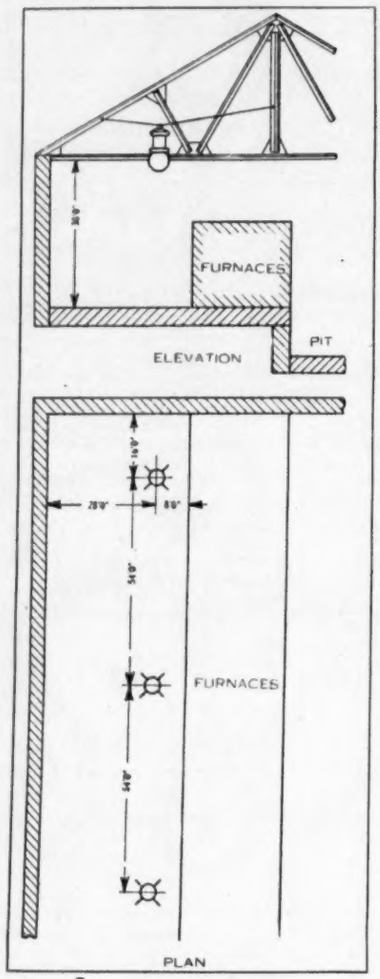


FIG. 3 — LARGE LAMPS IN AN OPEN-HEARTH FURNACE BUILDING

illuminants. For example, where tungsten lamps are used, they are either of the 220-volt type, or if 110-volt lamps are selected, which is often the case, two lamps must be placed in series across the 220-volt line. Furthermore, all lamps with internal mechanism must fulfill the condition for direct current, 220-volt operation, either by a multiple or a multiple-series arrangement.

Of course, features other than that of lighting have determined this condition, notably that of the use of the variable speed motor, which in the past has been largely limited to the direct current type.

On the other hand, 25-cycle alternating current is today fast becoming standard for steel mills and practically all new mills are installing alternating current and are converting only a part of the power for direct current use. As stated in the foregoing, direct current has been used almost universally in the past, but owing to the fact that power is now being applied to the main rolls, alternating current offers many advantages.

Surroundings and Conditions

Observations of existing iron and steel mill buildings show them in general to consist of large areas with high roof trusses and with unusually dark surroundings. From the illumination standpoint, the very dark surroundings are at the outset a distinct feature and a large problem. The sizes of the areas to be lighted in the majority of buildings form quite a contrast to the sub-divided section of the average factory manufacturing spaces, where the surroundings are apt to be somewhat lighter in color, and where the problems of extensive areas do not enter in to so great an extent.

Furthermore, it will be found in a great many cases that these large areas are used throughout for intermittent operations with perhaps a

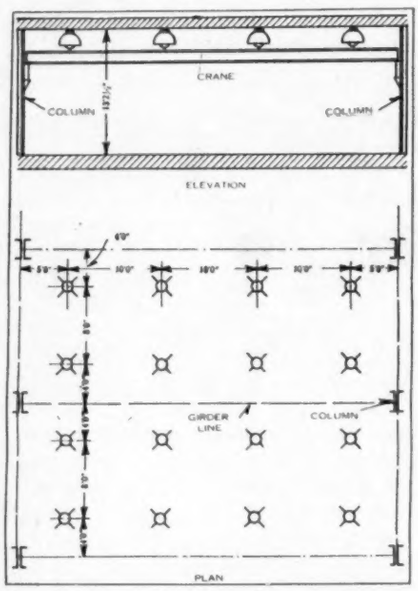


FIG. 4—PLAN AND ELEVATION OF MACHINE SHOP WHERE ILLUMINATION INTENSITY IS ADEQUATE WITHOUT DROP LAMPS

dozen men actively employed in the entire building. This condition exists, for instance, in the typical mills of large areas, such as the loading mills, where the sheets of metal are loaded by means of cranes on flat cars run directly into the mill; also, in flanging departments, where boiler heads are flanged in large numbers, but where the number of men employed is very small in proportion to the floor spaces involved. The

problem, therefore, becomes one of providing a large volume of light in order to illuminate these areas, and furthermore, to use lamps capable of penetrating the large distances between floor and roof truss line, which is often filled with smoke and dust or dirt in suspension.

Most of the buildings may be classed as of the open girder construction type. That is to say, the lamps must be mounted either from the roof; or must be attached directly to girder or roof truss; or must be suspended from stringer boards or other devices mounted between roof trusses. The crane service which is found in nearly all such buildings, limits the mounting height either to a position directly above the crane or on the sides of buildings between columns.

The difficulty experienced in attempting to outline any specific requirements for iron and steel mill

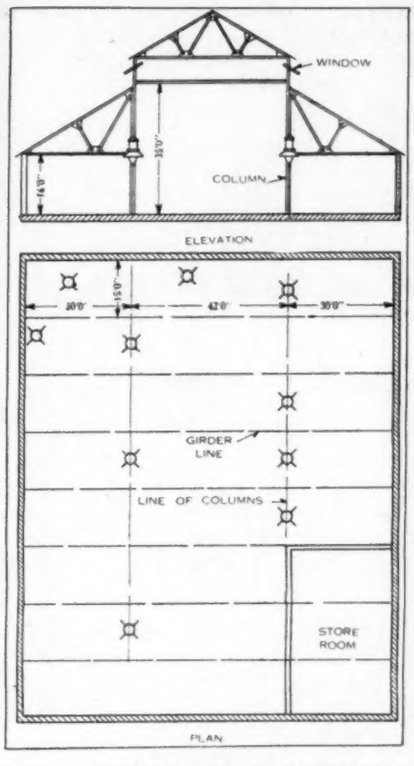


FIG. 5—INADEQUATE ILLUMINATION IN MACHINE SHOP OWING TO A POOR ARRANGEMENT AND INEFFICIENCY OF LAMPS

lighting is due chiefly to the large variety of buildings and to the diversity of work contained therein. Allowing somewhat for the difficulty thus encountered, these requirements, in a general way, are as follows:

(1) Workmen should be able to perform their duties and move around, not only with comparative ease, but with small accident risk as far as it depends on artificial illumination. In many cases this result may be obtained by the use of a low degree of general illumination. It may be here recorded, however, that in general a higher degree of artificial illumination is warranted in

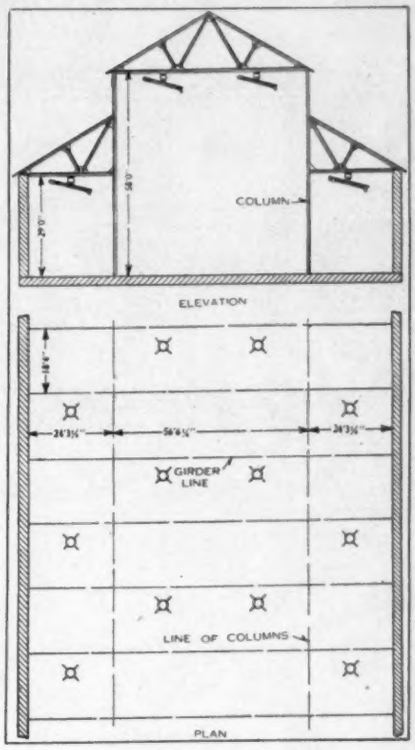


FIG. 6—UNIFORM ILLUMINATION INTENSITY ALTHOUGH NOT SUFFICIENT TO ELIMINATE NECESSITY OF INDIVIDUAL LAMPS

most of the buildings than has been the case in the past, or than will possibly be admitted in the near future as economical by many practical iron and steel men. This refers to a sufficient intensity to permit the performance of work at any portion of the floor space without respect to location of the lamps. Obviously, this can be obtained to the best advantage by means of the so-called overhead method of lighting.

(2) Where there is a choice between low and high mounting, the lamps should in general be mounted at the higher point in order to avoid the blinding effect produced when looking into lamps too near the floor.

(3) Lighting and motor circuits should be kept entirely separate. This will ordinarily insure reliable illumination, and the operation of the lamps is thus made far superior to those cases where the attempt is made to operate both lamps and motors from the same circuits.

(4) From the nature of the case, numerous instances will be found where the artificial illumination must be sufficient without the use of individual hand lamps. This is due to the nature of the work, which makes impracticable the handling of incandescent lamps by the workmen, but without sufficient light from overhead lamps it is impossible to realize the best results.

(5) From the engineering standpoint, the kind and size of the lamp should be consistent with the mounting height and also with the class of work under consideration. That is, for high ceilings large lamps should be used, while for low ceilings lamps of relatively small candlepower should be employed.

(6) Extensive yards are generally the scene of active work in the night, as well as in the day, in the transportation of materials. In order to facilitate such work the yard men should be furnished with a low degree of fairly uniform illumination. This in reality is practically

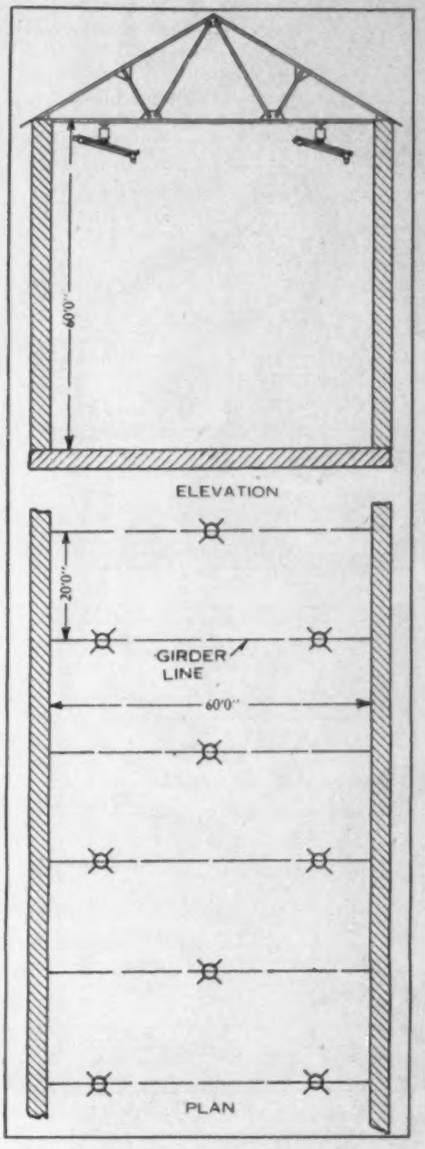


FIG. 7—ERECTING SHOP, SHOWING ARRANGEMENT OF MEDIUM SIZE LAMPS FOR HIGH ROOF TRUSSES, INTENSITY INADEQUATE FOR CONTINUOUS WORK

the only way to insure the greatest dispatch and the least possibility of accidents.

The foregoing requirements can today be met with available electric

lamps and with the advancement of the principles of illuminating engineering. One thing, however, should be added to these two items; namely, that of a higher standard of illumination in the iron and steel industry. It may even be stated that before these requirements will be realized in their largest degree, the appreciation of iron and steel mill operators for the economic results of adequate illumination must be broadened, including not only the common feeling that some light is needed, but also the ideas of the production equivalents which are known to exist in the relation of improved shop environment to greater output and more workable conditions.

Lighting From Overhead Lamps

In the average mills, the major portion of the work is of very large size, and constant attention to crane service in the handling of heavy

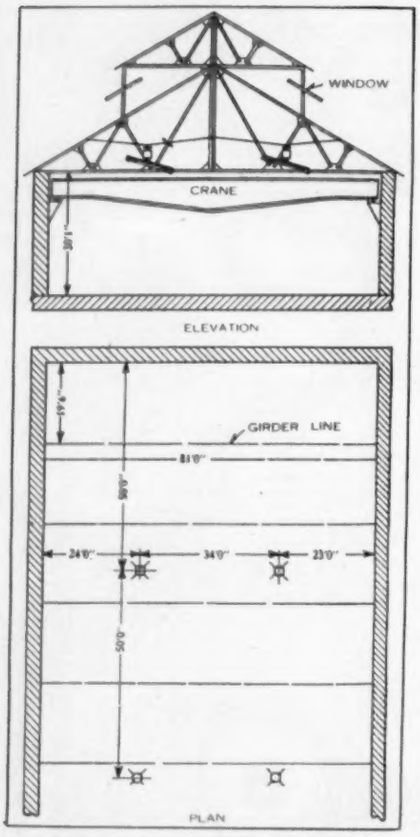


FIG. 8—FLANGING SHOP, WHERE INSUFFICIENT LAMPS RESULT IN POOR LIGHTING FACILITIES

materials is demanded. Features of this kind call for the elimination of individual lamps wherever possible, thus requiring general illumination of sufficient quantity and quality to make this elimination possible.

Extended investigations of the relative costs of the overhead lighting method and that scheme whereby part of the light is furnished from lamps mounted overhead, while the remainder is supplied from individual lamps close to the work, show that in a great many cases sufficient illumination can be provided from lamps above the heads of workmen

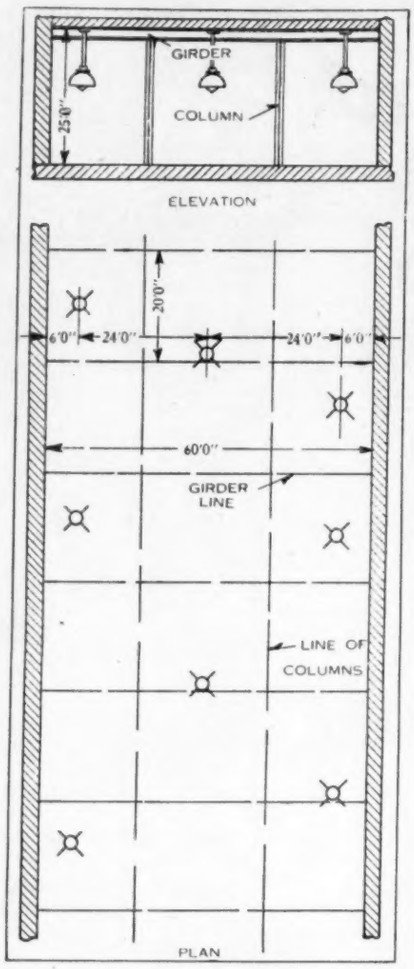


FIG. 9—PATTERN SHOP WHERE TUNGSTEN LAMPS FURNISH ADEQUATE LIGHT

with economy, both as regards first cost and operating expenses.

Many large machine shops connected with iron and steel plants, which have been equipped with lamps mounted overhead, and which afford very much better lighting facilities than formerly, are still provided with inadequate illumination intensities to permit of accurate work without the aid of individual lamps located close to the work. It cannot, therefore, be other than somewhat disappointing, when inspecting improvements which have been made in many plants of this kind, to note that the expenditures have not been accompanied by more than a partial solution of the lighting problem.

As an illustration, tests were made in one large machine shop where the working intensities of light from overhead lamps amounted to scarcely more than one foot-candle, and individual lamps were used almost universally on the machines. In this particular shop the expense for the new installation of lamps was very great. In distinction to this location, other locations are to be found where essentially the same class of work is performed and where the intensities of illumination range from three to five foot-candles from lamps mounted overhead, this quantity of light being just sufficient for the successful performance of work at night or on dark days. It is interesting to note in this connection that measurement of the light directly under the individual lamps in the former location amounted to about five foot-candles, so that the men in both places were working under essentially the same intensity, except that in the former case the region of high intensity of light was limited to a space directly below each individual lamp.

As a location somewhat typical of the classes of work found in the average mill, the foundry is selected

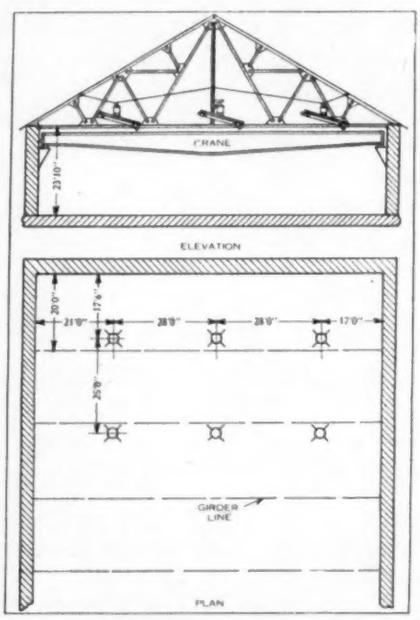


FIG. 10—ARRANGEMENT OF LAMPS OF MEDIUM SIZE OVER LAYING-OUT FLOOR

for somewhat more detailed treatment than might be deemed advisable were its importance, compared to the other buildings, the sole basis of such a treatment.

The lighting problems in these locations are peculiar because, not only must adequate light be furnished for the working operations, but accidents must be prevented and the sur-

faces of molds, which are nearly always dark, must be sufficiently lighted. This result must necessarily be obtained in buildings with dark ceilings and walls, and very often in buildings of very large areas, causing the necessity of a large number of relatively high candlepower lamps. On account of the very dark surroundings, and of the usually dark surfaces of the work, it is necessary in the main to provide more light on the work than would be the case were the surroundings light colored. The nature of the molds as regards shape and general make-up requires a sufficient number of lamps mounted over the heads of workmen to insure a small shadow effect.

The steam and dust in the air

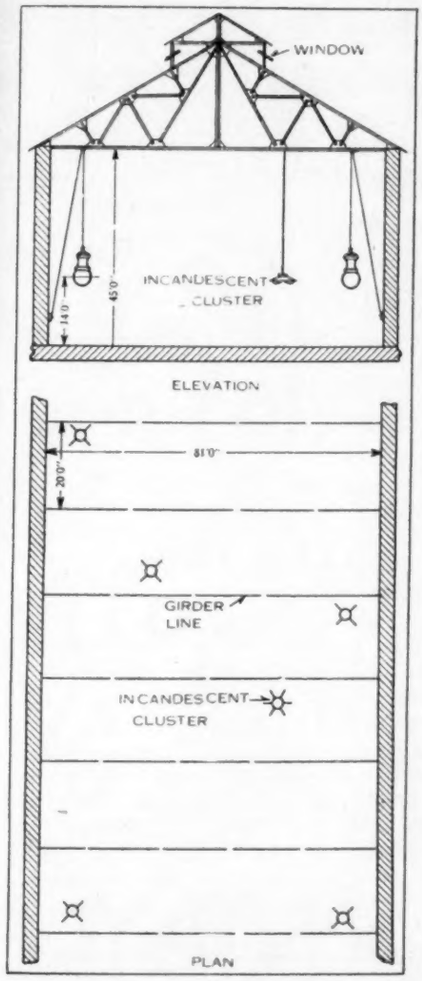


FIG. 11—BLOOMING MILL BUILDING, SHOWING POOR ARRANGEMENT OF LAMPS

form an obstruction through which the light must penetrate, and the deterioration of lamps with the deposits of dirt is apt to be somewhat more rapid than in other locations. It is, therefore, most important to provide for a rather high ultimate deterioration of the lamps in light-giving properties between the intervals of cleaning, either by providing a higher intensity of light when making the original installation or by increasing the intervals of cleaning the lamps and globes. It is obviously important in this connection to select a type of lamp which is capable of

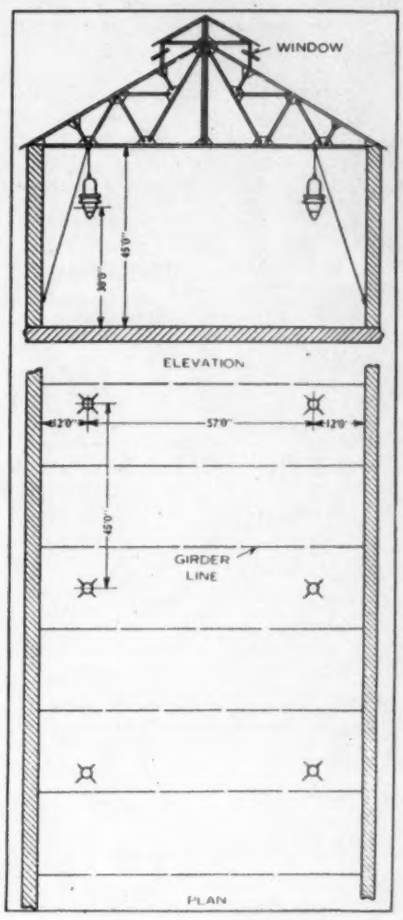


FIG. 12 — BLOOMING MILL, FIG. 11, WITH LAMPS ARRANGED SYSTEMATICALLY TO AFFORD BETTER DISTRIBUTION OF LIGHT

penetrating the dust and dirt in the air, and which is relatively unaffected by dust and dirt so far as light deterioration is concerned. A plan and elevation of a typical foundry is shown in Fig. 1, where the lamps as located furnish adequate illumination on the molds with comparatively low shadow effect. A reference to the elevation shows that the lamps are mounted rather close to the work, although not directly in the line of vision of the workmen. This feature of mounting the lamps rather close to the work is possible in quite a number of foundries, due to the construction of the building, but should never be carried to such an extreme that the glare becomes objectionable to the workmen.

In Fig. 2 another plan and elevation of a foundry are shown, where somewhat smaller lamps than in the preceding case are used. Intensities of two or three foot-candles have been found entirely adequate for successful foundry work, although numerous cases are to be found where intensities much below these values are in service.

Open-Hearth Furnace Buildings

A typical open-hearth building is shown in plan and elevation in Fig. 3. It will be apparent that the amount of light required for such work is rather small when compared to most of the work in other buildings. A considerable amount of light is produced by the furnaces themselves, which aids the workmen in getting around the floor space.

A small degree of general illumination should be provided and is often

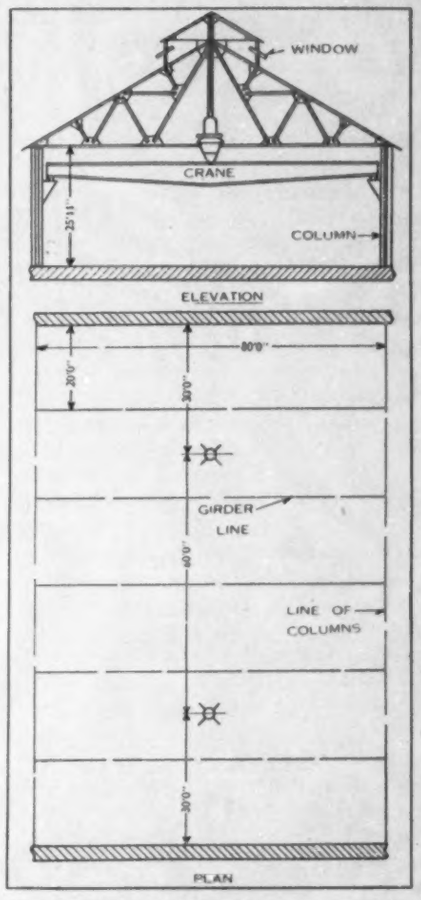


FIG. 13 — LOADING BANK OR SHED, SHOWING ARRANGEMENT OF LARGE LAMPS

absolutely necessary in order to insure safety as well as effective work. Fig. 3 indicates the arrangement of lamps in a typical open-hearth furnace building, where the intensity, although considered adequate for this class of work, is not in any sense excessive. In this connection, it is

well to note that the light from the furnaces is intermittent, and there are times when artificial light is urgently required in front of the furnaces, while at the back of the same some light is nearly always required at night and on dark days.

Machine shop work, from one standpoint, is more or less a secondary consideration in the iron and steel industry, although in some plants it forms a major portion of the work. For this reason, questions of machine shop lighting are important. Numerous machine shops not connected with iron and steel mills are to be found where general illumination with intensities equal to three, four, and even five, foot-candles are regularly in service. Where intensities of these values are in service the lighting is not considered at all excessive, and is often classed by superintendents who have become accustomed to the use of adequate artificial light, as barely enough to insure a successful output.

Machine Shops

The operations in iron and steel mill machine shops are in no sense an exception as far as artificial illumination is concerned to the general run of machine shop practice. In fact, due to the size of the buildings and to the surroundings, and also to the accuracy of the work often demanded, the illumination, if anything, should be somewhat greater in the machine shops of iron and steel mills than in some other cases. Fig. 4 indicates a section of a machine shop of a manufacturing concern where lamps mounted over the heads of the workmen provide about three foot-candles of artificial illumination.

In Fig. 5 a diagram is shown of a typical machine shop connected with a steel mill where enclosed arc lamps are installed in meager numbers over the floor space. The intensity of light found in this location amounted on the average to a little less than one foot-candle, and the distribution was so far from uniform that work could practically be performed only under one or another of the lamps, the benches located near windows very often being in practical darkness as far as the artificial light was concerned.

Good Shop Illumination

Fig. 6 shows a machine shop connected with an iron and steel mill, the lamps being indicated on the diagram in order to give an idea of the spacing distances and the mounting heights. Here the intensity of the illumination, by measurements, amounted to a little more than one foot-candle, and the general effect is good. The illumination is uniform over the entire floor space, and while the intensity is somewhat too low to permit of accurate work without the use of individual lamps, the care with which this system has been installed is commendable.

Erecting Shop

A typical erecting shop is shown in Fig. 7, and it will be noted that the height from floor to roof truss is exceptionally great. This great distance from roof to floor complicates the problem of providing adequate illumination to a great extent. In the particular location shown in this figure, the lamps provide an intensity of about 0.8 foot-candle on the working surface. This illumination is classed as fairly good at night, but it is hardly adequate for continuous and accurate work. Here again, if the increased expenditure for more lamps makes possible more rapid work, while the more cheerful surroundings prove a benefit to the workmen, it is warranted.

In flanging shops the work is usually carried on while the metal is at a red heat. The requirements, therefore, of artificial lighting are somewhat reduced. In general, however, the material is handled in a cold state over the various parts of the floor, and as a consequence a low amount of general illumination should be provided. The intensity of this general illumination can well be larger than the average values which are found in the majority of flanging departments. For example, in Fig. 8, a plan and elevation of a typical shop are shown, where the lamps are indicated to scale. Tests in this location showed the intensities to be exceptionally low—merely a small fraction of a foot-candle—and the light in this particular place is inadequate for the handling of material with any dispatch.

The typical shop under this class is a rather long, narrow building with comparatively low ceilings. The work with new wood presents relatively light surfaces which aid the illumination effect, and the surroundings are apt to be somewhat lighter in color than the average. Fig. 9 shows a plan and elevation of a typical pattern shop with the lamps indicated approximately to scale. Here 500-watt tungsten lamps are employed, and the intensity of the resulting illumination averages about two foot-candles, and is distributed in a fairly uniform manner over the entire floor space.

On laying-out floors and cooling tables the work is of such a nature that sufficient light must be provided on dark days and at night, to permit of the laying-out of forms on the cooling metal, and also the inspection of sheet metal which is to determine whether it will undergo a number of subsequent operations. If the illumination is not adequate to enable the detection of defects, a considerable amount of work is apt to be done on the material which is only later to be thrown out because of the defects which should have been noted prior to the various operations performed. If, therefore, the lighting is inadequate or poorly distributed so as to cause excessive shadows, much labor may be lost due to the passing of defective material as satisfactory.

A typical cooling table and laying-out floor is shown in diagrammatic form in Fig. 10. Here an intensity of about one foot-candle or a little less on the average is provided, and from various observations of this work at night, together with tests and inquiries from the various men, it may be stated that about twice this intensity, namely, two foot-candles, should be employed for continuous work in such cases at night.

Blooming Mills

While the major portion of the work in blooming mills is conducted with the metal at a red heat, some artificial illumination should be provided for the aisles, and in fact, over the entire floor space. As a matter of fact, hardly any artificial illumination is required while the metal passes through the rolls, but this work is intermittent, and there are times when the rolls must be repaired or inspected, and for these reasons, a small amount of general illumination provided by lamps equipped with suitable control circuits should be provided. A portion of a typical blooming mill is shown in Fig. 11. An inspection of this diagram shows that practically the only electric lamps available are located around the walls of the building. In this location the illumination, even at very short distances from the walls, is almost negligible, and as an improvement over the arrangement of lamps shown in Fig. 11, a revised scheme is shown in Fig. 12, where the intensity of light is approximately one foot-candle on the average, and the distribution is very much more uniform than shown in the former illustration.

Loading Banks

On loading platforms the problems of large areas and a small number of workmen are involved. Large amounts of material must be transported from one portion of the floor space to another with as much dispatch as possible, and at any given time the light is required at practically only one point, or possibly two or three points, throughout the entire floor space, where several cranes are simultaneously operated. These points at which the light is required are not at all defined, however, and so far as the work from day to day is concerned, one portion of the floor space is apt to be as important as another. Hence, general illumination from lamps mounted overhead is of the utmost importance.

A typical loading bank is shown in Fig. 13. Here long burning flame carbon arc lamps are employed, and tests show an average intensity of about 1½ foot-candles. The intensity found in this location is approximately sufficient, provided shadows are not so marked as to be objectionable. The reduction of shadows, however, is largely dependent upon the number of lamps used for given floor spaces, and the fact that a low intensity is sufficient virtually assumes that where lamps of large candle power are used only a few will be required. Hence, a small number of large lamps may be employed where the roof is high, but if the lamps are mounted low it will be desirable to use smaller units in larger numbers.

Yard Lighting

Yard lighting is of peculiar importance in connection with iron and steel mills on account of the large amount of transportation of materials between buildings. In order to dispatch the cars with advantage a small amount of illumination provided by lamps mounted in a systematic manner as regards spacing distance is necessary. Owing to the very large areas involved in such yards, the problem of providing adequate illumination is sometimes very difficult. It is recommended, however, that plans of the various yards be drawn up and the lamps located so as to furnish adequate light with a fair degree of uniformity. There is a tendency to place a lamp near an entrance to a building, and if a pile of material at some distance must later be worked upon at frequent intervals, another lamp is installed, and so on. In this way a large number of yards will be found where the arrangement of poles does not follow any well-defined system, and the resulting illumination is correspondingly inferior.

LIVINGSTONE CHANNEL

Opened to Commerce by a Fleet of Freighters and the Britannia.

Few realize that the commerce of the great lakes passes through an artificial waterway which is longer than that which will connect the Atlantic and Pacific oceans via the Panama canal. One of the most extensive of these cuts or dredged areas in this long waterway was opened to commerce on Saturday last, and will remain open as long as the world endures. This is the new Livingstone channel to the west of Bois Blanc Island, making an independent waterway for down-bound vessels and eliminating the possibility of collision with up-bound vessels at the Limekiln Crossing by avoiding it altogether. This crossing was until Saturday last the most congested strip of water in the world, dangerous to navigation, owing to the swift current, narrow channel and rocky bottom.

Work upon this great cut was begun in the spring of 1908 and was concluded about a week ago, when it was swept by the government. The work was done in the dry at a cost of $6,600,000. It was estimated that it would have cost about 50 per cent more to have done the excavating in the wet. The river was cofferdammed practically abreast, but somewhat south of Stony Island, where the natural depth was only five or six feet, and after the great cofferdam was pumped out, the work proceeded without interruption for four years. The new channel, extending from Stony Island to the Bar Point lightship, is practically six miles long.

The plan of a channel for down-bound vessels exclusively was conceived by William Livingstone, president of the Lake Carriers' Association, and the appropriation of the necessary money by congress for the work was largely through his efforts. The channel was therefore named in his honor, and the bulk freighter William Livingstone, owned by G. A. Tomlinson, of Duluth, was the one selected to pass through the channel first under the pilotage of President Livingstone.

Arrangements were made to have all down-bound vessels that reached the St. Clair lightship by eight o'clock Saturday morning anchor until one o'clock, when the Livingstone, which was moored at the Brush street wharf in the Detroit river, started down the stream.

Promptly at one o'clock, the Livingstone threw off her mooring lines and began her journey. Just as she did so, the fleet that had anchored began to appear at the head of Belle Isle. This flotilla of bulk freighters was under the direction of Captain J. M. Johnston, shore superintendent of the Cleveland-Cliffs Iron Co. The Livingstone was followed immediately by the excursion steamer Britannia, carrying 2,000 guests, and then came the fleet of bulk freighters and other available craft.

The Livingstone's progress down the river was in the nature of an ovation. Everything that had steam up saluted her to the end that her own whistle was rarely silent. She entered the Livingstone channel at 3:15, and rounded the Bar Point lightship at 4:30, where President Livingstone was transferred to the Britannia, which had on board the members of the Detroit Chamber of Commerce. They were addressed by President Livingstone and responses were made by Homer Warren, president of the Board of Commerce, Mayor W. B. Thompson and Congressman McMorran.

Those on board the Livingstone to do honor to the occasion were H. Coulby, president of the Pittsburgh Steamship Co.; J. H. Sheadle, secretary of the Cleveland-Cliffs Iron Co.; J. S. Ashley, of M. A. Hanna & Co.; Capt. John Mitchell, Capt. C. L. Hutchinson, S. P. Shane, A. L. Rumsey, John M. Mulrooney, C. B. Calder, general manager of the Toledo Ship Building Co., R. B. Wallace, general manager of the American Ship Building Co., Frank Jeffrey, general manager of the Detroit Ship Building Co., and a few invited guests.

The Lake Carriers' Association tendered a complimentary dinner to President Livingstone at the Hotel Pontchartrain on Saturday night. Addresses were made by H. Coulby, G. A. Tomlinson, George H. Russel, Geo. H. Barbour, Homer Warren, Capt. Dennis Sullivan, Col. Patrick, Col. C. McD. Townsend, General Lydecker and Chief Justice Moore.

The day was an ideal one for the occasion, being one of the brilliant days that make October famous in this climate. The setting was a glorious one, and President Livingstone had reason to be proud of the manner in which the new channel was dedicated to commerce. It was undoubtedly the proudest day in his life.

THE IRON TRADE REVIEW

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Cleveland, October 24, 1912

Now and in 1909

The recovery in the iron and steel markets has now reached a stage where it is interesting to make comparisons with the last rise, which occurred in 1909. After the sudden slump in demand towards the close of 1907, there was a sustained market in steel products for 15 months, when a sudden break occurred, Feb. 19, 1909, and prices fell rapidly for from two to three months. Pig iron, which had declined first and then had started advancing in August, 1908, declined again, so that both pig iron and steel products reached a low point about the middle of the second quarter of 1909. Then a recovery set in. At first, prices advanced slowly, and indeed some steel products advanced slightly, while others were still declining, so sharp was the rebounding tendency in each line. By July 1, the advance was in full swing. In pig iron, it continued until nearly the close of the year, and in steel products quite to the close. True to its traditions, southern pig iron led in the decline, as it always does in advances. It weakened visibly by the middle of November, and in the next month pig iron declined slightly in nearly all other markets. The Chicago market and the valley market for Bessemer, however, did not yield until the following February. On the whole, pig iron rounded the turn smoothly, holding at the high point for but a short time. Steel products, on the other hand, held steady at the high point for several months, and although no advances occurred after Jan. 1, 1910, the year was several months old before it was clearly recognized that a definite downward trend was established. This, in brief, is the history of the 1909 movement, and the precise dates at which the different products reached their high points are not material.

Once prices began definitely to trend downwards after the 1909 movement, the decline was practically uninterrupted, though it was not precisely continuous. Steel prices declined in a sort of terrace fashion, finding now and then a level at which there was definite resistance for a time. The declines continued through 1910 and the major part of 1911. In finished steel products, a clear cut low point was reached late in November, 1911. At these low prices, the lowest touched, on an average, since the early part of 1899, and the very lowest on record in the case of a few products, the mills filled up comfortably and then occurred the announcement of the Republic Iron & Steel Co., that its price on merchant steel bars was advanced to a minimum of 1.10c. That announcement was made on Nov. 29, 1911, and in the retrospect it is interesting to recall how it electrified the trade. Prices had been declining so continuously and ruthlessly that it actually startled the trade to realize that there was a possibility of such a thing as an advance. In December, prices of steel products hardened generally, and in January there were further advances, but in February the market weakened again, striking a low point about a dollar a ton above the November low point. From that time to the present, the advancing tendency has been continuous.

Pig iron did not find its low point at the same time as finished steel. Its low point fell about midway between the November and February low points in steel; in other words, about Jan. 1, 1912.

The following table, compiled for the purpose of comparing the present rise in prices with that of 1909, starts with the low prices of 1909, reached in the second quarter of that year, then gives the high points on the rise of that year, some of these being reached in November and others in December; then it gives the low points of last winter and winds up with prices now ruling, taking present prices for ordinary deliveries, neither the premium prices paid for especially prompt delivery nor the low prices which may perhaps be done occasionally for delivery at mills' convenience.

Two Price Movements Compared

	The 1909 Movement.		The Present Movement.	
	Start.	Finish.	Start.	Present.
Foundry pig, Birmingham	$11.00	$15.00	$ 9.75	$13.50
Bessemer pig, Valley	14.50	19.00	14.00	17.00
Basic pig, Valley	14.00	17.50	12.25	16.00
2X Foundry, Philadelphia	16.00	19.00	14.75	17.25
Foundry pig, Cleveland	14.50	18.25	13.25	16.50
Bessemer billets, Pittsburgh	23.00	27.25	19.00	26.00
Steel bars	1.10c	1.50c	1.05c	1.40c
Structural shapes	1.20c	1.55c	1.10c	1.50c
Steel plates	1.25c	1.55c	1.10c	1.50c
Wire nails	$ 1.60	$ 1.85	$ 1.50	$ 1.75
Sheets No. 28	2.15c	2.40c	1.75c	2.25c

In every instance, the prices at the start of the present movement were lower than the prices at the start of the 1909 movement. In every instance, also, present prices are lower than the highest prices of the 1909 movement. These differences approximately balance; in other words, the amount of the rise has been approximately the same in each case. With pig iron, prices have advanced, on an average, a trifle less this time than in the 1909 movement, while in all the steel products mentioned, except sheets, the total amount of the rise has averaged the same each time. In sheets, the recent rise is much greater than that in 1909. That is not because sheets are high now, but because they fell to an exceptionally low level last November, a level far below the low point in 1898, when all steel products were extremely low. Bars, plates, shapes and wire, on the other hand, have not in

recent years fallen to as low levels as in 1897 and 1898.

Thus while the present movement and that in 1909 are similar in the extent of the rise, they are dissimilar in the levels attained, present prices being measurably below those reached in 1909. Another point of difference is in the period of time involved. In 1909, pig iron definitely advanced during about six months only. This time, there has been an advancing tendency for about nine months, although the tendency has been marked for only about seven months. In steel products, counting from the stiffening which occurred at the close of November, the advance has covered ten and one-half months, and dating from the slight recession in February, a period of fully eight months.

As the total advance in this movement has at least been no greater than that in 1909, and as the time covered is measurably greater, the movement has been a slower one. The criticism is being made sometimes that the advance is too rapid. If so, it is nevertheless slower than that of 1909, even though the fact of prices having dropped to a lower level would tend to make it more rapid. These, of course, are differences in degree. In character the movement is not particularly dissimilar from that of 1909.

Having compared the present movement with that of 1909, the question naturally arises whether the experience of 1909 may be regarded as indicating anything as to the outcome of the present movement. In the first place, it must be observed that our comparisons are between the top of the 1909 movement and the present, not with the top of this movement, for that top has not been reached. Obviously the present is not the top, unless the movement should suddenly be arrested.

In the amount by which production expanded in the two movements there is a startling difference. Consulting our monthly blast furnace reports, it is found that the low point before the 1909 rise was in May, 1909, the highest production in the movement being in February, 1910. Similarly, there was a low point last December, and we have for comparison the record of last month, although this month will doubtless show an increase. The average daily rate of coke and anthracite pig iron production in the crucial months was as follows:

May, 1909	57,687
February, 1910	86,747
December, 1911	65,558
September, 1912	81,201

Thus the present movement started on a much higher basis, but has not thus far attained the previous rate. The previous movement showed a gain of fully 50 per cent, but the present movement thus far has shown a gain of only 24 per cent. There is therefore vastly less reason to fear overproduction this time than there was last. The figures adduced are likely to cause surprise in many quarters. In the first place, the production last December does not seem to fit with a period of extremely low prices. The fact is that production had gained for several months, from July to October, even though prices were falling, and then it decreased slightly to December. In the second place, although the iron and steel industry is assumed to be running at full capacity, it is observed that production last month was at a lower rate than nearly three years ago. Several factors enter into the explanation of this curious showing. In the first place, while the steel interests have been operating their blast furnace departments practically full of late, there have been many idle merchant furnaces. In 1909, on the other hand, the merchant furnaces nearly all got into operation. In the second place, the production in February, 1910, was a forced production, at a rate which could not have been maintained indefinitely. During a long period of quiet, the blast furnaces had been put in excellent condition, and at the top of the movement the number of furnaces out for relining and other repairs was far below normal. Such, of course, is hardly the case today. Finally, there are furnaces idle today through inability to secure raw material, coke and ore, which was not the case the other time. There is a popular superstition that iron and steelmaking capacity has wonderfully increased in very recent years, but this is not the case. There was a large increase from 1907 through 1909, but in the past two or three years the increase has been relatively small, and as pig iron prices are lower now than at the top of the previous movement, there are furnaces written out of the reckoning, at least for the present, because their costs are prohibitive with present selling prices.

The Use of Power

Abraham Lincoln, said Robert G. Ingersoll, was the one man in history who, vested with supreme power, never abused it save on the side of mercy. Many men have been trusted with great power and history reeks with the bloody stories of how they abused it. Many other men, although not burdened with as great responsibility as was the immortal Lincoln, have held highly important trusts with absolute fidelity.

Likewise with the corporation, the artificial individual. Some corporations have had great power, but none has had the supreme power of a Lincoln. Some corporations, like some men, have abused their power. Others have not.

To what extent shall power be entrusted to men and corporations? A governor could liberate all the prisoners in his state by granting them pardons. A corporation could crush its competitors. But some confidence must be reposed in men, whether they hold positions connected with governmental or with corporate affairs. Wise laws can restrain men, but sound public sentiment can do even more.

Willis L. King was asked at the United States Steel Corporation hearing, in Pittsburgh, whether the Corporation could put all its competitors out of business if it desired to do so. It would have been just as pertinent to ask him whether he thought Governor Tener was likely to grant pardons to all the prisoners in Pennsylvania. Admit, for the sake of the argument, that the Corporation could crush its competitors. To do so would be certain to kill its business and destroy the Corporation, just as the abuse of the pardoning power would be political suicide to a governor. The time has passed in this country when the people will submit to merciless, conscienceless methods in business. The Steel Corporation's greatest strength today lies not in its plants or any of its material resources, but in the good will of its competitors, resulting from fair business methods, and in the growing conviction of the American people that this great Corporation is not abusing its power and will not do so. If the Corporation has no soul, it at least has common business sense.

MEN OF THE IRON TRADE

C. Hayward, of Domhoff & Joyce Co., Cincinnati, returned on Oct. 14 from a three weeks' vacation spent in Oregon.

H. B. Douglas, Hammond, Ind., has been appointed traveling superintendent of all the plants of the Standard Steel Car Co.

W. E. Wright was elected president of the Knox Automobile Co., Springfield, Mass., at the recent meeting of the stockholders.

W. S. Ransom, of Matthew Addy & Co., Cincinnati, pig iron and coke dealers, returned last week from a month's vacation in the Bermuda Islands.

J. E. Upson, president of the Upson-Walton Co., Cleveland, and his family have left for Los Angeles, where they will make their future home.

T. A. Baldwin has been transferred from the bridge and construction department of the Pennsylvania Steel Co., Steelton, Pa., to the Boston office of that company.

A. F. Merry, mechanical superintendent of the Erie plant of the General Electric Co., sailed on Oct. 12, for a two months' trip in Europe, in the interests of his company.

Stephen Badlam, formerly assistant superintendent of rolling mills of the Pennsylvania Steel Co., Steelton, Pa., has accepted a position with the Crucible Steel Co. of America, at Pittsburgh.

T. W. Guthrie, general manager of the Standard Welding Co., Cleveland, who was recently operated on at a hospital in that city, is making a good recovery and was taken to his home Oct. 20.

F. W. Beach, formerly manager of sales of J. M. & L. A. Osborn, Cleveland, has become manager of sales of the Massillon Rolling Mill Co., Massillon, O., maker of black and galvanized sheets.

Frank M. Eaton, Cincinnati resident partner of Hickman, Williams & Co., pig iron, coke and alloys dealer, has just returned from a two months' vacation spent in the mountains of Colorado.

Lucian Haas has accepted the position of head tool designer of the Peerless Motor Car Co., Cleveland, having resigned the position of assistant engineer of the Alden-Sampson Mfg. Co., Detroit, Mich.

H. S. Philbrick has resigned the assistant professorship of mechanical engineering at the University of Missouri, to take the chair of professor of mechanical engineering at Northwestern University, Evanston, Ill.

Marcus L. Hewitt and C. C. Titus of the Northwestern Metal Co., Helena, Mont., have departed on a trip to Chicago and New York on business connected with their thermo-electric process of ore reduction.

John George Gates has joined the engineering division of the Toledo Machine & Tool Co., Toledo, O. Mr. Gates was formerly in the designing department of the Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

William Loeffler, 826 St. Claire avenue, Sheboygan, Wis., for many years foreman of the Jenkins Machine Co. at Sheboygan, has resigned to engage in the manufacture of several devices which he designed and patented.

J. Edward Schemier has been elected manager of the Keeley Stone Co., Columbia, Pa., to fill the vacancy caused by the recent death of William D. Snyder. John G. Hughes has been elected secretary-treasurer of the company.

A. G. Black, formerly foreman of the testing department of the Knox Automobile Co.'s plant in Springfield, Mass., and lately chief inspector of the plant, has been placed in charge of the repair department, which was recently reorganized.

Jean Brustlein, of Unieux, Loire, France, has arrived in this country to study American methods of steel making and is now attached to the Midvale Steel Works, Philadelphia. He is a son of a former director of the Unieux Steel Works, of France.

Benjamin Briscoe, president of the United States Motor Co., has resigned. With his family he will sail about the middle of November for a several months' tour of Europe. Mr. Briscoe has been prominent in the automobile business since 1899.

T. S. Clark, president of the Perry Iron Co., Erie, Pa., whose stack was recently sold to Pickands, Mather & Co., Cleveland, expects to leave Erie for a milder climate, but has not yet come to any definite decision as to where he will live or what business he will engage in.

J. E. Fischer, general superintendent of the Beaver Dam Malleable Iron Co., Beaver Dam, Wis., for 15 years, has tendered his resignation. No successor has as yet been selected by the board of directors. Mr. Fischer has not made announcement of his plans for the future.

Benjamin Talbot, inventor of the continuous steel-making furnace bearing his name and now connected with the Cargo Fleet Iron & Steel Co., Ltd., Middlesbrough, England, has arrived in this country from England. Mr. Talbot was formerly connected with steel works in this country.

R. H. Wilkinson Jr., superintendent of the Anna furnace, Struthers, O., has tendered his resignation to take effect Jan. 1. Former manager, S. A. Richards, will take charge. Mr. Richards is a stockholder and director of the company and will resume his old position after having taken a much needed rest.

William M. Tilderquist, who for the past two years has been superintendent of the Hibbing district west end mines of the Oliver Iron Mining Co., has resigned because of ill health, and will remove to Duluth in a short time. He will be succeeded by William F. Pellenz, who formerly held the position of superintendent of the Sellers mine.

W. H. Foster, president, and A. C. Tobin, manager of sales for the General Fireproofing Co., Youngstown, O., have departed for a trip of six weeks or two months through the principal trade centers of Europe. They will confer with present sales agents of the company and also extend the foreign sales department.

Kern Dodge, a well-known engineer of Philadelphia, has returned from a year's travel abroad and announces the opening of an office in the Morris building, Philadelphia, where he will devote himself henceforth to the engineering and financing of public service properties. Mr. Dodge was one of the founders and for many years one of the partners of the well-known engineering firm, Dodge & Day. His new offices are in the suite with the banking firm of William A. Read & Co.

EXPORTS INCREASE

Making Largest Total on Record, Excepting May of This Year.

The tonnage exports of iron and steel in August showed an increase of 10,000 tons over June or July, the total being 282,835 gross tons of scrap, pig iron, rolled iron and steel, wire, nails, pipes and fittings, etc.

IRON AND STEEL EXPORTS, GROSS TONS.

	August,		Eight months ending August,	
	1911.	1912.	1911.	1912.
Scrap	6,158	10,771	57,596	72,962
Pig iron	8,801	23,994	85,378	172,697
Billets, sheet bars, etc.	12,005	34,699	161,424	199,947
Wire rods	1,536	4,899	11,096	42,123
Rails	41,879	41.147	311,732	312,894
Steel bars	11,619	22,547	82,797	128.363
Iron bars	1,294	2,261	12,301	13,264
Structural	16,508	27,639	142,173	192,324
Hoop, band and scroll	740	1,236	1,055*	6 886
Sh'ts and plates	28,417	52.487	219,210	361,854
Tin plates	5,804	5,934	36,095	60,099
Barb wire	7,577	8,631	54,282	62,951
All oth. wire	11,058	15,089	85,353	104,657
Cut nails	1.278	656	7,155	7,432
Wire nails	3,227	7,466	33,060	51,735
All other, includ. tacks	1,164	344	8.512	6,952
Pipes & fit'gs	18,363	18,334	130,147	172,270
Railroad spikes	†	1,605	†	†2,185
Bolts, nuts, rivets, washers	†	2,226	†	†3,776
Horse shoes	†	67	†	†189
Cast radiators	474	803	2,344	3,066
Totals	177,902	282,835	1,441,710	1,978,626

*Not stated prior to July 1, 1911.
†Not stated prior to July 1, 1912.

The August exports were the largest on record for a month, with the single exception of May of this year. The exports for eight months of the year were 1,978,626 tons, being at the rate of 3,000,000 tons a year. Exports in January and February were relatively small, and it is interesting to observe that the exports for the following six months were at the rate of 3,250,000 tons a year.

The value of all iron and steel exports in August was $25,450,107, this value covering the tonnage items just referred to, as well as hardware and cutlery, machinery, etc. This total value has been exceeded in only two months, April and May of this year.

IRON AND STEEL IMPORTS, GROSS TONS.

	August,		Eight months, ending August,	
	1911.	1912.	1911.	1912.
Scrap	851	1,778	13,423	11,373
Pig iron	10,447	13,067	107,999	77,671
Blooms, billets, steel n. e. s.	3,971	1,316	21,366	12,100
Wire rods	1,283	1,254	11,284	9,635
Rails	197	716	523*	2,495
Bar iron	2,699	1,416	19,195	16,793
Structural	65	188	281*	1,584
Sheets and plates	138	593	1,548	2,440
Tin plates	293	244	12,662	1,296
Totals	19,944	20,572	188,281	135,387

*Not stated prior to July 1, 1911.

The value for eight months of the year was $190,411,532, or at the rate of $285,000,000 a year.

Iron ore imports in August were 178,828 tons, or slightly less than in any of the three months preceding. Ore imports thus far this year have been heavier than last year, but show a decrease as compared with 1910.

IMPORTS BY MONTHS.

	1910.	1911.	1912.
January	56,207	33,071	20,028
February	43,613	20,812	11,622
March	54,176	23,533	15,466
April	47,698	22,392	12,482
May	42,569	23,347	15,955
June	30,322	29,399	21,407
July	41,933	15,782	17,916
August	36,879	19,943	20,572
September	30,961	14,039	.....
October	31,455	21,035	.....
November	40,585	13,878	.....
December	31,575	19,665	.....
Totals	487,973	256,903	135,387

ORIGIN OF ORE IMPORTS.

	August.	Eight months.
Spain	5,781	80,145
Sweden	23,667	243,605
Canada	17,757	46,864
Newfoundland and Labrador	12,600	75,263
Cuba	116,100	903 665
Other countries	2,923	9,342
Total	178,828	1,358,881

IRON ORE IMPORTS, BY MONTHS.

	1909.	1910.	1911.	1912.
January	105,233	284,823	102,600	154,118
February	61,749	170,427	94,820	129,693
March	108,676	163,633	134,785	157,469
April	74,782	236,135	133,900	178,502
May	97,393	240,833	217,467	194,482
June	124,714	193,415	118,296	180.122
July	172,316	248,810	200,845	185,677
August	209,855	282,949	175,183	178,828
September	164,613	208,892	184,456	.....
October	178,051	219,571	172,459	.....
November	174,966	197,833	128,019	.....
December	222,609	173,719	148,902	.....
Totals	1,694,957	2,591,031	1,811,732	1,358 881

The figures for the first eight months of the three years are as follows:

1910	1,791,025
1911	1,177,896
1912	1,358,881

Ore imports by months since the beginning of 1909 are shown in the accompanying table, while another table shows the countries of origin for this year's imports.

IMPROVES PLANT

Wheeling Mold & Foundry Co. is Making Additions.

The Wheeling Mold & Foundry Co., Wheeling, W. Va., is completing a number of improvements designed to facilitate manufacturing operations at its plant.

It is now constructing a 60 x 160-foot building to be used for the manufacture of rolls. Into this the lathes and other roll-making equipment will be moved. The company is extending its recently erected storage yard crane runway, from 500 to 600 feet in length. The completion of this extension will necessitate the removal of the present cleaning shops.

A new crane runway, 300 feet in length, is also being erected. This is to extend above the pig iron stock yard and charging floor and one of its uses will be to charge the open-hearth furnaces by crane instead of by hand. The columns of this new runway will be extended 15 feet vertically and will be roofed over, thus providing space for pattern storage above the runway. Figures are being taken on a 30-ton electric traveling crane, 55 foot span, to correspond with this runway.

The Wheeling Mold & Foundry Co. has recently added a road machine department. At present, small limestone crushers for agricultural purposes are being turned out. Eventually other types of road machinery will be added, including crushers of large size.

The Reading Iron Co., Reading, Pa., effective Oct. 17, announced a scale of increased wages. The puddlers received an advance of 25 cents a ton or from $4.50 to $4.75. The wages of other employes are being raised from 5 to 7 per cent.

VALUE OF IRON AND STEEL EXPORTS—TONNAGE AND NON-TONNAGE.

	1908.	1909.	1910.	1911.	1912.
January	$ 13,468,058	$ 13,329,388	$ 14,513,394	$ 18.739,961	$ 18,451,914
February	14,063.559	10,947.159	13,949,082	18,690,792	21,801,570
March	15,168,155	13,874,461	17,258,503	22,591,991	24,474,799
April	15,455,319	13,058,054	16,529,254	24,916,912	26,789,853
May	11,281,415	12,993,197	17,658,042	20.616.795	28,050,247
June	11,677,944	13,779.736	16,503.204	20,310.053	24,795,802
July	12,085.951	11,866,772	16 108.102	17,454,772	24,913,052
August	12 058,561	14.136,219	17,628,538	20,013,557	25,450 107
September	11,221,799	12,966,908	16,776,178	20.534,139	.....
October	11,535,063	14,249,598	17,452.085	20,799,591	.....
November	10,895,549	14,434,600	18,593,806	21.547,379	.....
December	12.231,741	15,075,183	18,300,710	22,186,996	.....
Totals	$151,113,114	$147,680,331	$201,271,903	$249,656 411	$190,411,532

EXPORTS OF TONNAGE LINES—GROSS TONS.

	1908.	1909.	1910.	1911.	1912.
January	74,353	70.089	118,652	152.360	151,208
February	81,773	84.860	110.224	150,919	204,972
March	96,681	94,522	124,980	216,360	218 693
April	93,285	100,904	117,921	228,501	267,312
May	64,341	109,977	135,306	178,589	307,656
June	59,770	114,724	120,601	174,247	273,185
July	86,796	100.680	128 216	162,855	272,944
August	86,244	105,694	131,391	177,902	282,835
September	76,732	97,392	119,155	181,086	.....
October	85,766	110,821	129,828	186,234	.....
November	71,130	115,943	155,138	187.541	.....
December	77,659	137,688	150,102	190,938	.....
Totals	964,242	1,243,467	1,537,943	2,187,809	1,978,626

Practical Plans for Enlarging Foreign Trade

Discussed by National Machine Tool Builders' Association—
Expectation of Tariff Legislation—Decides Not to Change Name

A more vigorous extension of foreign trade in American machine tools and the methods best adapted to the promotion of this end, represented a general topic occupying the principal thought and discussion of the National Machine Tool Builders' Association at its eleventh annual convention held at the Hotel Astor, New York City, Oct. 16, 17 and 18. The sessions were well attended, the registration reaching about 150, and all were characterized by a spirit of concise business treatment which resulted in the disposal of a large volume of interesting matters.

The subject of export trade and its ramifications, a topic to which manifestly American manufacturers are giving more serious attention at this time, ran through most of the addresses and discussions of the open sessions. This feature of the convention clearly signified an appreciation by American machine tool builders that the occasion is ripe for a more determined and intelligent pushing of their products into the markets of the world. Apprehension of tariff revision at this time is undoubtedly a factor in stirring these manufacturers to a more active and thorough consideration of the export field.

An important detail of the expansion of foreign trade was advanced in the proposal to use an association catalog, contained in a paper by Stanley H. Bullard, of the Bullard Machine Tool Co., Bridgeport, Conn., on "The Use of an Association Catalog in the Development of Foreign Markets." Mr. Bullard spoke of the advantages to be gained by the circulation of such a publication among foreign buyers. The subject was discussed by J. H. Heald, of the Heald Machine Co., Worcester, Mass.; S. H. Reck, of the Rockford Drilling Machine Co.; Wm. Lodge, of the Lodge & Shipley Machine Tool Co., Cincinnati; C. H. Norton, of the Norton Grinding Co., Worcester, Mass.; F. M. Mandon, a Paris dealer, and others, and was generally approved. This discussion resulted in the appointment of a committee consisting of S. H. Bullard, C. H. Norton, B. B. Quillan, of the Cincinnati Planer Co., Cincinnati, C. A. Johnson, of the Gisholt Machine Co., Madison, Wis., and S. H. Reck. Later this committee reported and recommended that the association proceed with the compilation and issuance of an association catalog, the work to be carried on by the committee in conjunction with the manager of the organization and the details to be taken up by letter ballot. The association voted to do this.

In his address on "Export Trade", W. A. Viall, of the Brown & Sharpe Mfg. Co., Providence, set forth the problems that beset the American manufacturer in the export market in competition with European builders, but said he believed that the same careful attention paid to the wishes and special conditions surrounding the needs of foreign customers as is given to American buyers would result in satisfactory returns. Too often the American manufacturer looks upon the foreign market, the speaker said, as an expedient to be utilized only in times of dull home demand and he usually displays an indifference to the requirements of foreign trade which he never will do in the case of his American patron.

New Officers of Machine Tool Builders' Association

President—E. P. Bullard, Jr., Bullard Machine Tool Co., Bridgeport, Conn.

First Vice President—A. T. Barnes, W. F. & John Barnes Co., Rockford, Ill.

Second Vice President—R. K. LeBlond, The R. K. LeBlond Machine Tool Co., Cincinnati, O.

Treasurer—A. E. Newton, Reed-Prentice Co., Worcester, Mass.

Secretary—C. L. Taylor, The Taylor & Fenn Co., Hartford, Conn.

Advocates Mechanical Section

E. J. Kearney, of Kearney & Trecker, Milwaukee, Wis., advocated the formation of a separate section of the association where the mechanical men in the industry could meet for the discussion of improved designs of metal working machinery and parts. In this way, he believed that the former professional spirit of the mechanic in the machine tool industry might be partially re-established, at least, with the result that better machines and broader demand in the markets of the world would be gained. Mr. Kearney proposed that the time of the annual convention of the machine tool builders be extended to include several days which could be set apart entirely for the consideration of mechanical subjects and proposed the holding in New York by the association at stated intervals of five or more years of an exhibition of metal-working machinery in which each exhibitor would be restricted to one machine of a type. Only machines that show noteworthy improvement over those displayed by the same competitor at the previous exhibition would be admitted.

"I do not expect," he said, "that the mechanical end can ever be reinstated in its old position of supreme importance when coping with a sales organization that reaches around the world, but we must not lost sight of the fact that in order to be successful in the markets of the world we must be able to offer at all times the best and the most advanced design to be found anywhere and I stand as an advocate of any plan that will further that end.

"My whole thought is this, we must first have machines and then salesmen to introduce them, if we are to maintain ourselves in the foreign market. More than this, I say boldly in the home markets, for our experience during the past year shows clearly whither we are tending as regards protection.

"Let us develop through our association the highest grade of commercial spirit, and use, if possible, this same instrumentality to better our product, to the end that in a measure the professional mechanical spirit of yore be re-established in our midst, so that the foreign invader, should he ever find his passage through the customs house unobstructed, will be greeted elsewhere with the sign of the uplifted hand."

The resolutions committee reported on Mr. Kearney's suggestion, recommended that these matters be referred to a special committee to be appointed by the president and that a report of the deliberations and recommendations of this committee be reported

to the association at its next meeting. This resolution was adopted.

Indorse Patent Commission

Upon the subject of patent laws, the association endorsed the recommendations of President Taft that the proposed changes in the existing patent laws be referred to a specially appointed commission, composed of men best qualified to judge of such methods. This action followed after the presentation of a very complete report on this subject by C. H. Taylor, of the Taylor & Fenn Co., Hartford, Conn., chairman of the committee on patents. Mr. Taylor summarized the present conditions very clearly in his report, which is as follows:

During the last session, a number of bills pertaining to patent matters have been presented to congress, the most important of which, a bill to codify, revise and amend the laws relating to patents, H. R. 23417, was introduced by Mr. Oldfield, chairman of the patent committee of the house on April 16, 1912. The original bill provided for many radical changes in the existing patent law. It was reported to the committee on patents and after numerous hearings was reported on Aug. 8 in a revised form which really amounted to a substitute bill and in which many of the more radical provisions were modified. No action was taken by congress before adjournment but the bill will probably receive consideration durin the coming session.

Although many of our members are undoubtedly familiar with this bill, it may be well to call your attention to certain sections that provide for the compulsory granting of a license under certain conditions, and prohibit the use of a patent to restrain unreasonably or to monopolize trade or commerce, except in such articles as, and to the extent, that they embody the discovery or invention so patented. The bill restricts the resale price of the patented article, and provides for the limitation of its sale, the restriction of its sale to certain customers or in certain territory; and for the granting of terms or conditions of sale more favorable to one customer than to another.

Your committee suggests that each member secure a copy of the bill as reported, read it thoroughly, and carefully consider the full meaning of these proposed changes. Besides studying the bill and its effect, if enacted into law, it might be well to consider what abuse, if any, has grown up under our present system and what changes for the benefit of the general public could be made without injustice or hardship to the owners and users of patents.

As indicated by the number of bills which have been presented to congress, it would appear that a strong influence is being brought to revise our patent laws and everyone interested should become familiar with the subject and be prepared to act when the matter is again taken up. President Taft has recommended that a committee be appointed to take under consideration all proposed changes in our patent laws, and to report the results of its investigations to congress.

We strongly urge that such a course of action should be pursued. If the patent law needs correction, it should be revised by experienced men rather than as a political measure. The present condition of affairs will not be improved unless the changes are made by men who have a full knowledge of the existing needs.

In previous reports, we have mentioned the efforts which have been made towards securing the passage of a law creating a court of patent appeals. Owing to the many matters which were brought up before the last session of congress, the subject was not given proper consideration. However, many leading members of both houses are impressed with the necessity of creating such a court and there is no doubt that congress will act either upon the existing or modified bills if this matter is pressed upon their attention.

The National Association of Manufacturers and the American Bar Association are taking a most active interest in these matters and we believe by co-operating with them, the best results will be accomplished.

A paper on the subject "How Can We Secure Adequate Patent Protection?" was presented by Samuel W. Banning, of Banning & Banning, Chicago, counsellors at law.

Retains Present Name

Upon the subject of changing the present name of the association to a shorter title and to one more clearly expressive of the products of the association, the convention adopted the recommendation of the resolutions committee that the name of the organization be retained as the National Machine Tool Builders' Association. This title has become well and favorably known and furthermore it is possible to clearly define in the constitution the limits of the membership, it was stated. Previously in the convention, official announcement was made by the officers of the defeat by mail ballot of the proposal to change the name of the association to the National Metal Working Machinery Constructors' Association. The vote resulting in 60 negative and 29 affirmative. The spring meeting of the association will be held in New York City and will consist largely of committee sessions. The convention took this action upon the motion of the former secretary, C. E. Hildreth, who favored a spring session held in a business center and given over wholly to business work.

J. O. Harron, of Harron, Rickard & McCone, machinery merchants, of San Francisco and Los Angeles, addressed the convention in behalf of the Exposition Co., of San Francisco, and invited the machine tool builders to exhibit their products at the coming San Francisco exposition, to be held from Sept. 20, to Dec. 4, 1915. Mr. Harron spoke of the facilities to be provided in the machinery building for such exhibits, of the favorable prospects for a great exposition and emphasized the improvement of labor conditions in San Francisco and vicinity. The exposition committee of the association will give the matter attention.

During the convention, C. Wood Walter, of the Cincinnati Milling Machine Co., Cincinnati, spoke on the present status of tariff legislation. Later he talked to the machine tool dealers on the same subject.

Secretary Charles E. Hildreth, who has served the association so long and well in that capacity, made his valedictory report at the opening session showing the steady progress of the organization. Mr. Hildreth would not consent to re-election. The duties of secretary will hereafter be attended to by General Manager James H. Herron. Mr. Hildreth most deservedly was given a rousing vote of thanks for his past services.

The following firms were admitted to the membership at the meeting: Union Twist Drill Co., Athol, Mass.; Turner Machine Co., Danbury, Conn.; Beaman & Smith Co., Providence, R. I.; Blake & Johnson Co., Waterbury, Conn.; Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.; Zeb & Hahnemann Co., Newark, N. J., and the Rivett Lathe & Grinder Co. was enrolled in place of its predecessor, the Rivett Lathe & Mfg. Co., Faneuil, Mass.

Machine Tool Dealers' Meet

A meeting of machine tool builders under the auspices of the National Supply & Machinery Dealers' Association, was held at the Hotel Astor coincident with the convention of the machine tool builders' association, but in separate sessions. About 50 dealers were in attendance and various questions affecting the handling of machine tools from the dealers' standpoint received attention.

In greeting the dealers, Henry Prentice, of the Prentice Tool & Supply Co., New York City, first vice president of the association, spoke of the substantial present conditions and of the promising outlook of business and commented upon the effects of a more active competition from foreign manufacturers likely to

result from threatened tariff revision. He said in part:

We face a condition which calls for greater efficiency in the conduct of our business; we must study to secure a larger volume and at less expense. In view of the tariff agitation, we cannot at present, at least, hope to obtain from our manufacturers larger selling commissions, although in many instances these are sadly needed. The burning question today is: How can we secure more productive net results in the fields in which we are operating? What is the right answer to this question? Let us consider it in all its bearings and exchange views freely. The salient features of greater efficiency seem to me to include, firm adherence to the manufacturers' resale prices; carrying of stock by the manufacturers; uniform terms; factory delivery; non-cancellation of orders; confining our operation to our exclusive territory; fair and courteous treatment of our competitors; intelligent and energetic attention to our own business.

Thomas A. Fernley, secretary-treasurer of the National Supply & Machinery Dealers' Association, in a report covered the work of the machine tool branch of the association. He told of the results of the ballot on the cost of doing business, distributed immediately after the convention. This showed that the expense of distributing machine tools remained practically unchanged and still averaged between 11 and 12 per cent on the selling price. The association has requested that the manufacturers' commissions or differentials be arranged with a view to affording a net profit after defraying the selling expense, as it is argued that it is to the interest of the manufacturers that the dealers should receive such compensation as would justify them in aggressively promoting the sale of the former's products.

The subject of uniform proposal blank was covered in the report as follows:

A uniform proposal blank was adopted after conference with the representatives of the National Machine Tool Builders' Association and after thorough discussion by the New York City meeting last fall. The proposal blank adopted was issued to the members under date of Dec. 1, 1911, and from reports received, we are assured that it is being closely adhered to in all proposals covering the sale of machine tools issued by the members of this association.

The secretary reported that several cases had come to the attention of his office where the manufacturers of machine tools had quoted users as low a price as they had the dealers. This was regarded as a very unfair practice. On the subject of prices, the report says:

You understand that in accordance with the law, we do not attempt to ask the manufacturer not to quote a certain price to any class of trade. All we ask is that the trade of the members of this association be not restrained, but if the manufacturer wishes to quote the user a discount on certain tools, he should place the dealer—be he a member of this association or not—in a position to quote the same discount and to have a profit after paying his selling expense.

Various trade questions were considered and discussed by the dealers. With respect to a dealer representing more than one manufacturer of the same or similar lines of product, the consensus of opinion favored loyalty to one line. It was agreed that a dealer was justified in maintaining expensive display rooms. Upon the subject of the encroachment of one dealer upon the territory of another, it was reported that this unfair practice was considerably less prevalent than formerly, due in a measure to the more friendly relations and to the educational functions performed through the association. It was stated there was much less deviation than formerly in the dealers respecting the selling policies and schedules of the manufacturers, due likewise to the association's work and to the realization it was unwise to cut below necessary profits. The belief was expressed that educational institutions were not entitled to special discounts from the dealers and the opinion prevailed that if donations out of philanthropic motives were to be made to these institutions, it would be more appropriate to make them in cash.

N. M. T. A. Convention

The executive council of the National Metal Trades Association, which also met at the Hotel Astor during the machine tool builders' convention, fixed upon Wednesday and Thursday, April 9 and 10, at the Hotel Astor as the time and place for the next annual meeting of that organization.

S Diescher & Son, Pittsburgh, have awarded a contract to the Wheeling Mold & Foundry Co., Wheeling, for 10 stands of hot mills, 12 stands of cold mills, a gear drive for the cold mills, and a full equipment of doubling shears and squaring shears. This equipment will be installed in the new plant which is being erected by the Wheeling Sheet & Tin Plate Co., at Yorkville, O.

WHEELING IS BUSY

As Shown by Heavy Pay Rolls—Contract For Mill Equipment.

Wheeling, W. Va., Oct. 22.—The total amount in wages paid out last week by the various iron and steel and tin plate plants in Wheeling and across the river was the largest reached in several years, the combined pay rolls being slightly under $1,000,000. The return of "good times" is reflected by greater activity in nearly all lines, and especially in the amount of new construction which is going on about the city. One problem which is troubling the manufacturers more than any other at present is the scarcity of labor. The Wheeling Steel & Iron Co. advises that it could use from 300 to 400 more men if they were available. The Wheeling Can Co. adopted a novel means of increasing its number of operatives. It distributed 10,000 hand bills throughout the Wheeling district calling for more men. The response to this appeal was not as satisfactory as was expected, but in this way the company secured enough men to turn out its contract work on time. The car shortage is being felt slightly in Wheeling, but this question has not become acute as yet.

The Johnson-Morse Can Co., Wheeling, a consolidation of the La Crosse Can Co., of La Crosse, Wis., and the Wheeling Can Co., recently completed a large new plant. It covers two acres and contains 84,000 square feet of floor space.

The Center Foundry & Machine Co., Wheeling, is doubling the capacity of its foundry and constructing a new building for the cleaning department. It has also purchased a new 10-ton electric traveling crane to be installed in the foundry, and equipment for a new power plant. This company produces gray iron castings for the jobbing trade.

The Whittaker-Glessner Co., Wheeling, is adding two new hot mills at its Whittaker plant in Wheeling. They will be ready for operation about Nov. 15. The plant will then have a total of 14 hot mills.

The Mutual Electric & Machine Co., Wheeling, has just added to its equipment several small-sized punches and shears. No further improvements are planned at present.

The Tennessee Coal, Iron & Railroad Co. is contemplating some extensive improvements in its Blocton, Ala., mines, to better the working equipment and to promote the health and comfort of its employes.

ELABORATE PROGRAM

Of Iron and Steel Division of Mining Engineers' Meeting.

The 103rd meeting of the American Institute of Mining Engineers will open in Cleveland, Monday evening, Oct. 28, with a social session. Technical sessions will be held Tuesday, Wednesday and Thursday. A subscription banquet for members and guests, including ladies, will be held at the Statler hotel, Wednesday evening. There will be a smoker Tuesday evening.

In the iron and steel division, the program of papers is elaborate and includes a number which promise to be highly interesting. It includes papers by E. P. Jennings, on a "Titaniferous Iron Ore Deposit in Boulder County, Colo.;" by C. M. Weld, on the "Ta-yeh Deposits in China", and by S. Whinery, on "Clinton Deposits in Kentucky and Tennessee."

Exploration is dealt with in E. E. White's paper on the "Method of Surveying and Sampling Diamond-Drill Holes", while the preparation of ores is represented by N. V. Hansell in a paper on the "Concentration of Iron Ores."

W. H. Blauvelt and F. E. Lucas will present papers on the "Manufacture of Coke." Papers relating to blast furnace practice are those of J. E. Johnson Jr., on the "Effect of Alumina in Blast Furnace Slags, and on Charcoal Iron;" of Ralph H. Sweetzer, on the "Blowing-In of Blast Furnaces," and of John J. Porter, on "The Utility of Efficiency Records."

Cupola practice is represented by John J. Porter, on "Fuel Efficiency of the Cupola;" and by R. Moldenke, on "Melting Iron in the Cupola Furnace," while Bradley Stoughton's "Notes on Titanium and the Cleansing Effect of Titanium" summarizes the literature on the subject and records the results of many special experiments.

"Electric Heating and Removal of Phosphorus From Iron" is the title of a paper by A. E. Greene.

"Recent Developments in Open-hearth Practice," by N. E. Maccallum; and "The Function of Slag in Electric Steel Refining," by R. Amberg, enter the field of the manufacture of steel; while Robert W. Hunt's "Recent Developments in the Inspection of Steel Rails" deals with one of the most important finished products.

Developments in metallurgy are brought forward by a weighty paper by H. M. Howe on "Notes on Ruff's Carbon Iron Equilibrium Diagram;" by Albert Sauveur's and C. A. Reinhardt's "Case Hardening of Special Steels;" and by William Campbell's "Notes of the Microstructure of Steel." The latter applies particularly to the special steels, other phases of which are dealt with by Robert R. Abbott in his "Comparison of the Action of Various Carbonizing Materials;" and by Mark A. Ammon, in his "Measurements and Relations of Hardness and Depth of Carbonization in Case-hardened Steel."

NICKEL SUPPLY

Of Canada Held as Factor For World Peace.

Ottawa, Can., Oct. 22.—That Canada possesses the key to the European naval problem because of this country's importance as practically the sole source of the world's supply of nickel for use in nickel-steel armor plate is the text of an article in a report of the conservation commission of the Dominion, just issued.

"It has just been discovered that Canada possesses the key to the European naval problem," states the report. "When Schneider in 1889 introduced the use of nickel into the manufacture of steel armor plates he little realized that he was placing in Canada's hands a great means for maintaining the peace of the world. Battleships without nickel steel armor would be utterly helpless before modern guns. If nickel were no longer obtainable, armor construction would go back a quarter of a century. Canada today produces about 90 per cent of the world's supply of nickel. Practically all of the remainder comes from New Caledonia, an island in the southwestern Pacific controlled by France. In 1910 the value of nickel ore and matte exported from Canada to the United States was approximately $3,450,000. As the only refineries in America are in the United States, nearly six-sevenths of the Canadian nickel was refined to the south of the border. Consequently if Canada were to prohibit the export of nickel the nickel steel industries of Europe would fall into decay and high grade armor plate for battleships would be an impossibility."

The Richmond, Fredericksburg & Potomac railroad has ordered five superheater Pacific passenger locomotives from the American Locomotive Co. The Atlanta & West Point railway has placed one 10-wheel freight locomotive and one six-wheel switching locomotive with the same builder.

ATLAS ENGINE

Works at Indianapolis, Ind., Sold by Receiver.

Indianapolis, Ind., Oct. 22.—Fred C. Gardner, receiver for the Atlas Engine Works, has sold the property to the Lyons-Atlas Co., just incorporated here with an authorized capitalization of $500,000. The new concern will employ about 2,000 men and will continue the manufacture of silent Knight valve sleeve motors and Diesel oil-burning engines. Officers of the new company are: President, James W. Lyons; vice president, William P. Lyons; and secretary-treasurer, George Lyons. All are from De Pere, Wis., where they have been engaged in the manufacturing business.

Under the terms of sale the purchaser is to pay $441,000 interest on a $1,500,000 bond issue, secured by a mortgage deed of trust to the Indiana Trust Co., trustee; $105,000, an indebtedness incurred by a bond issue of $150,000; $48,187.04, secured by bills and accounts receivable amounting to $63,000; $80,000 to be paid to the receiver for receivership expenses and debts incurred during the receivership, and $6,700 in judgments against the Atlas company. The property is taken subject to the mortgage deed of trust, but all personal property, merchandise, patent rights, accounts and bills receivable are conveyed outright, free of liens. Common stockholders will receive nothing, nor will Hugh H. Hanna, who indorsed several hundred thousand dollars worth of notes for the Atlas company.

At one time the Atlas company was one of the largest manufacturers of steam boilers in the United States. Later the manufacture of gasoline motors was started and the patent rights to the steam boilers disposed of. In the last year the company has had the American rights to manufacture the silent Knight sleeve valve motor for the trade and has also made Deisel oil-burning engines.

Open Hearths at Edgar Thomson Works

It is expected that the first of the new open-hearth furnaces now being installed at the Edgar Thomson works of the Carnegie Steel Co., Bessemer, Pa., will be ready for operation about April of next year. The remaining furnaces of the unit of six now being installed will be completed very shortly thereafter. This will be the first open-hearth steel ever made at the Edgar Thomson works.

MINING COMPANY

Formed to Operate on the Menominee Range.

Duluth, Oct. 22.—The McGreevy Steel Co., with J. C. McGreevy, of Duluth, as president, is the name of a new mining concern formed to operate at Iron river, Menominee range. The corporation is organized under the laws of Utah and is capitalized at $500,000. The board of directors is composed of J. C. McGreevy, J. W. Irwin, Henry Turrish, R. N. Chaffee and Paul Chamberlain, of Duluth; John Shepack, of Green Bay, Wis., and James D. Pardee, of Salt Lake. The company has taken over the Sheridan mine and other promising properties, including the LeRoy and Boyinton, on both of which ore has been located. Diamond drill work has been conducted at the LeRoy all summer. The new corporation has also taken over the Bucholtz property of the Iron River Iron Ore Co. and the lease to the Purcell property, north of Iron river, recently procured by Mr. Chamberlain and others. The Sheridan mine is to be equipped with new machinery at once and the unwatering of the workings will be started within a few weeks. The shaft will be sunk several hundred feet deeper. New equipment will also be installed at the Bucholtz mine, which will be put in operation as soon as the machinery is ready. Mr. Chamberlain, who is a practical mining man, will be in active charge of the company's work.

Blair Furnace Port Installation

The Blair Engineering Co., 17 Battery place, New York City, has equipped one or more furnaces with its open-hearth furnace ports in the plants of the following companies: Bethlehem Steel Co., Southern Iron & Steel Co., Pittsburgh Steel Co., Lackawanna Steel Co., Lukens Iron & Steel Co., Maryland Steel Co., Illinois Steel Co., National Tube Co., American Steel & Wire Co., Atlanta Steel Co. and the Nova Scotia Steel & Coal Co., Ltd.

This system of port construction includes a water-cooled, hollow steel hood which covers the entire gas port of an open-hearth furnace and permits the entire block of the furnace to be built of magnesite in a melting medium of the basic type and of silica sand in an acid furnace. This forms a barrier between the incoming gas and air, so that the whole end construction of the furnace becomes almost indestructible, and by properly controlling the mixture and the direction of the gases, it greatly retards the burning out of the furnace. It is claimed that furnaces equipped with Blair ports show a low cost for repairs.

INCREASE SHOWN

In Earnings of Pullman Co. for Year Ended June 30 Last.

Net earnings of $17,287,557 are shown by the report of the Pullman Co. for the year ended June 30 last, as compared with $15,617,467 in 1911. This is equal to 14.41 per cent earned on the capital stock, as compared with 13.01 per cent earned last year. The income account compares as follows:

	1912.	1911.
Total income	$40,219,748	$38,994,610
*Expenses	22,932,191	23,377,143
Net	17,287,557	15,617,467
Depreciation	6,859,098	4,477,434
Surplus	10,428,459	11,140,032
Dividends	9,599,460	9,599,336
Balance	$828,998	$1,540,696

*Includes repairs of cars, taxes, insurance and proportion of net earnings paid other interests in sleeping car associations controlled.

Rushing Furnace Improvements

The Woodward Iron Co., Woodward, Ala., is rapidly pushing the improvements at the Woodward furnace, begun last July. The foundation of the new furnace has been laid and within a short time the iron work will begin. The five stoves, which are 110 feet high and 37 feet in diameter, will soon be completed. The reservoir, which is under way, is 500 feet in diameter and 30 feet deep. When it is completed it will hold 2,000,000 gallons of water, which will be sufficient for all mechanical work done at the furnace. A rotary blower, which is operated by a 5,000-horsepower engine has been installed by the Westinghouse Electric & Mfg. Co., as an experiment in place of the old blowing engines. If the new engine proves satisfactory it will replace the old type in the furnace.

Spanish Ore Trade

Commenting on the Spanish ore trade, the Middlesbrough correspondent of the *Iron & Coal Trades Review* says:

"There has been but little movement in the foreign ore trade this week, consumers on the whole being well stocked. Sellers are firm on the basis of 23s for best Bilbao rubio of 50 per cent quality, ex-ship Tees."

BRITISH IRON TRADE

Works Hampered by Lack of Raw Material.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Oct. 12.

Demand for pig iron has surpassed supply to a greater extent than ever, yet prices in Cleveland have declined a little during the week, solely on account of the Balkan trouble to which the sensitive Cleveland market instantly responded. Already recovery is noted and the week closed with No. 2 pig iron at Middlesbrough at 65s 10½d ($16.13), with 66s 3d ($16.22) one month. Cleveland pig iron is scarce and makers have no stocks, withdrawals from Connal's stores in two days being equal to the whole of September. The scarcity of pig iron has become so serious that works are being compelled to curtail their output and there will be much pressure for raw material between now and Christmas. The amount of Cleveland iron in store is now 268,000 tons. Steel-making irons are in fair demand but the high price of coke is causing unsettlement, blast furnace quality selling at 24s in the Cleveland district.

Were it not for the excellent American reports, the Balkan troubles would very seriously affect the quarterly meeting; as it is, likely advances were staved off. In the Midlands, the effect of certain price advances is being felt in increased imports of Belgium material, including especially wrought iron for nuts and bolts, etc. Fortunately for British makers, all the Belgium steel works are congested with orders, many being booked to next June. Several minor advances are noted, makers of tin sheets increasing their price £1 per ton, steel hoops being advanced 5s per ton and galvanized sheets selling now at 13s per ton. It is frankly admitted that United States sheet mills have increased their hold on the South American trade. Imports of semi-finished steel are not increasing because Belgiums cannot promise immediate delivery. British material may be obtained at £6 to £6 2s 6d. Armament makers at Sheffield look forward to three years full work. The high-speed steel and cutlery exports from Sheffield to the United States show improvement after comparative quiet. The tin plate trade is busy, many firms having taken orders which will absorb their output to June of next year.

LATEST MACHINERY NEWS COLLECTED IN LEADING MANUFACTURING CENTERS

In New York, the aggregate of business booked during the past week compared favorably with any similar period of the year. This condition applied particularly among machine tool dealers, who benefited by the distribution of large orders by the American Locomotive Co., the New York, New Haven & Hartford railroad and the General Electric Co. It is estimated that these companies contributed upward of $225,000 worth of business. In addition, a good total of miscellaneous buying was done and inquiries for machinery for shops and manufacturing plant equipment continued heavy. New York dealers, in attendance at the meetings of the National Machine Tool Builders' Association, reported that sentiment among visiting members was unanimously optimistic.

In Pittsburgh, a slight lull took place in the machine tool market last week, and the only sales reported were small ones, comprising drill presses, hacksaws, etc. A few fair-sized inquiries have come into the market, one of these being for 10 machines. The latter, however, has not yet been very generally distributed. In rolling mill machinery, a large contract was awarded by S. Diescher & Son, Pittsburgh, to the Wheeling Mold & Foundry Co., Wheeling, W. Va., for 10 stands of hot mills, 12 stands of cold mills, a full equipment of doubling shears and squaring shears, etc., for the new plant of the Wheeling Sheet & Tin Plate Co., at Yorkville, O. The Wheeling Mold & Foundry Co. is in the market for an electric traveling crane. Some large orders for power plant equipment have been booked the past week.

In Cleveland, dealers in heavy machines were well satisfied with last week's business. Several large machines were sold and business in this line continues excellent. The Upson Nut Co. is expected to order shortly the tools given in its small list, issued several weeks ago, and 60 heating furnaces. Opinions among dealers on market conditions vary, some reporting the largest aggregate since August, while others complain of a falling off. This slackening is thought to be temporary. All grades are going well, some trouble being experienced in filling orders for automatic lathes and turret machines. The railroads are reported to have good-sized lists under advisement. Second hand machinery is going slowly. In general, heavy machines are going more freely than smaller ones.

In Cincinnati, contracts for machine tools during the past week have been mostly for single tools. Manufacturers state that large lists are not so general as they used to be, as the companies making the inquiries are sending only a specified list of certain tools to each maker, dividing them according to the likelihood, in their opinions, of these different makers securing the contracts. Business on these small orders, though, has been good enough recently to warrant the prediction of a fairly good month. Second hand machinery continues without any improvement over that of last week, but it is good in comparison with a month or two ago. Electrical equipment is selling at a satisfactory rate, but has not shown any general marked improvement. This business, however, has been active as good as any in the machinery line for several months.

New Construction

The Charles G. Allen Co., Barre, Mass., is erecting an addition 70 x 70 feet, to its foundry.

The Duplex Metals Co., Chester, Pa., has had plans prepared for the doubling of their plant. Contracts for the work will be let in the near future.

The Two Rivers Plating Works, Two Rivers, Wis., has awarded a contract for two additions to its plant. A full line of metal novelties will be manufactured.

The Keystone Driller Co., Beaver Falls, Pa., is considering the erection of a new forge shop and another building. The latter will probably be used as an assembling department.

The Universal Nut & Bolt Lock Co., Newport, Ky., maker of the Martin patent nut lock, whose increase in capital stock from $50,000 to $75,000 was recently noted, advises that it is about to increase its equipment. It will erect a new building in the near future, to be built of brick and steel, about 50 x 150 feet. The company states that the demand for its nut locks is far greater than was anticipated in view of the short time they have been on the market.

The Century Electric Co. has purchased a lot adjoining its property at Nineteenth and Pine streets, St. Louis, for $30,000, upon which it will erect a $150,000 seven-story fireproof building. Work will begin at once.

The Acme Machine Tool Co., Cincinnati, O., will increase its capital stock from $100,000 to $150,000, the additional capital to be used to make extensive improvements and expansions to its plant. C. H. M. Atkins is president of the company.

The Union Water Meter Co., Worcester, Mass., is to erect an addition to a store and tool house in the rear of its factory in Hermon street, that city. The new structure will be of wood, 16 x 65 feet, one story high, with tar and gravel roof.

The Nelson Bros. Co., whose machine shops and foundries were removed to Saginaw, Mich., last winter from Alma, Mich., has made plans to construct a factory addition and warehouse on seven lots, just purchased.

The Moser Machine Mfg. Co. has taken a site in the city of Kane, Pa., and will immediately erect a large plant. It is proposed to begin operations with several hundred men and increase the forces in ratio to the demand for the company's product.

Manager E. C. Beardsley of the Klamath Falls Machine Shops, Klamath Falls, Ore., announces that a new foundry and machine shop and warehouse will be erected soon. The foundry and machine shop will be 50 x 157 feet and the warehouse, which

will adjoin the main building, will be 50 x 75 feet. The buildings will be entirely of steel and the equipment will be modern throughout. Included in the new machinery will be a 10-ton crane for moving heavy castings, and a steam hammer.

The Mechanics Foundry & Machine Co., Fall River, Mass., is to erect a large addition to its plant in Davol street and Remington avenue. It has bought a tract of land adjoining its present property and will build a machine shop, 50 x 100 feet, one story, of brick.

Work has been started on two new shop buildings for the Chain Belt Co., 736 Park street, Milwaukee, Wis., under the direction of Leenhouts & Guthrie, architects. One building will be two stories high, 42 x 70 feet in size and the other one story, 51 x 118 feet.

New Buyers

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

The following manufacturing companies have filed articles of incorporation:

The Gray Mfg. & Machine Co., Ltd., Toronto, capital, $24,000; provisional directors, Alex Gray, James Gray and Robert Gray.

Ultra Motor Car Co., Boston; capital stock, $100,000; incorporators, R. H. Randall, president; Elisha A. Bagg, treasurer, and C. A. Parker.

United Fuel Co., Boston; capital stock, $5,000; incorporators, John C. Foster, president; Charles B. Moseley, treasurer, and William W. Blatt.

Petrolia Motor Car Co., Ltd., Petrolia, Ont.; capital, $300,000; provisional directors, Wm. English, Chas. H. Metcalf, John A. McKenzie and others.

The Dayton Brass Casting Co., Dayton, O.; $15,000; by James D. Platt Jr., Thomas F. McDonald, Cecil W. Mason, Robert G. Corwin, Robert K. Landis.

Brown Engine Co., Fitchburg, Mass., capital stock, $150,000; incorporators, J. F. Perault, president; Moses J. Perault, New York, treasurer, and H. B. Rust.

American Sanitary Lock Co., Indianapolis; $10,000; by directors, Leo Kahn, Indianapolis; E. H. Campbell, Springfield, Ky.; Jackiel W. Joseph, Indianapolis.

Grosvenor & Co., of Canada, Ltd., Montreal; $10,000; to manufacture, import and deal in engineering and other appliances, engine room devices and specialties; by Edgar E. Rothschild, London, Eng.; Alexander Solomon, Ferdinand I. Spielmann, William Sebag Montefiore and Alexander R. Hall, all of Quebec.

Davis King Co., Acton; to deal in motor vehicles, supplies, etc.; capital stock, $20,000; incorporators, A. W. Davis, president; Hobart E. Mead, treasurer, and B. A. King.

George H. Lincoln Co., Boston, to manufacture iron castings; capital stock, $50,000; incorporators, Adaline L. Lincoln, president; George L. Lincoln, treasurer, and Frank B. Foster.

The Minaki Boat & Supply Co., Ltd., Minaki, Ont.; capital $20,000; to manufacture motor boats, engines, machinery, etc.; provisional directors, John H. Parkhill, Henry P. Blackwood, Vivian V. McMeans and others.

American Ever Ready Co., Boston; to deal in electrical goods; capital stock, $2,000; incorporators, C. Hubert, president; Uriah S. Kolby, East Orange, N. J., treasurer, and H. W. Hale.

James W. Poole, Inc., Boston; to manufacture and deal in electrical apparatus; capital stock, $50,000; incorporators, James W. Poole, president and treasurer; Alfred E. Poole, and Mary M. Poole.

The Columbus Auto Parts Co., Columbus, O.; $25,000; to manufacture automobile parts and do a general manufacturing and repair business; by Reynold H. Klugee, Chas. J. Krag, Corinne K. Klages, John J. Stoddart and Walter D. McKinney.

The Gray Mfg. & Machine Co., Ltd., Toronto, Ont.; $24,000; to deal in and manufacture mill supplies, engines and machinery of all kinds, also manufacture steel; by Alexander Gray and Catherine A. Gray, Pt. Credit, Ont.; James Gray, L. S. Gray, M. F. Gray and Robert Gray, Toronto.

Financial

The Seneca Chain Co., Kent, O., has reduced its capital stock from $300,000 to $150,000.

The New Britain (Conn.) Machine Co. has increased its capitalization from $500,000 to $600,000.

The Rockford Malleable Iron Works, Rockford, Ill., has increased its capital stock from $75,000 to $200,000.

The Emerson-Brantingham Implement Co., Rockford, Ill., has increased its capital stock from $50,000 to $100,000.

The Muncie Foundry & Machine Co., Muncie, Ind., recently increased its capitalization from $50,000 to $100,000.

Power Plant Equipment

Power machinery is wanted by the Farmers' Union Mills, which is erecting a 100-barrel flour mill. A 100-horsepower boiler and a 75-horsepower engine are to be purchased.

The Paducah, Ky., Cooperage Co. has closed a deal for the purchase of 2,700 acres of timberland near Charleston, Miss., and is to erect a stave mill. Power and wood-working machinery will be purchased.

The Danville, Ky., Light & Power Co. will enlarge its plant and extend its service to Perryville and Junction City, Ky. Later a traction line to the latter point, 5 miles distant, may be built.

Sealed proposals for a power house will be received at the Middletown state homeopathic hospital, Middletown, N. Y., until Oct. 30. Drawings and specifications may be obtained at the office of State Architect Herman W. Harper, capitol, Albany, N. Y.

The Acker Electrical Co., Sheboygan, Wis., has been awarded the contract for doing all work and furnishing all material for the addition of 500 horsepower to the power plant of the Hamilton Mfg. Co., Two Rivers, Wis. The additional power will be used to operate the new steel cabinet shops of the Hamilton company.

The Southern Wisconsin Power Co., Madison, Wis., operating an electrical power plant on the Wisconsin river at Kilbourn City, Wis., intends to enlarge its capacity by the installation of another dynamo. The company now operates four dynamos of 1,500 kilowatts, furnishing 8,000 horsepower. Part of this output is transmitted as far as Milwaukee, where it is used by the Milwaukee Electric Railway & Light Co. The Kilbourn plant is considered the largest hydro-electric plant in the northwest.

The Racine, Wis., Gas Light Co., Kenosha, Wis., Gas & Electric Co. and Kenosha Electric Railway Co., recently acquired by the North American public service interest, have been merged into a $2,000,000 corporation known as the Wisconsin Gas & Electric Co. J. D. Mortimer, president of the companies, and general manager of the Milwaukee Electric Railway & Light Co., and allied corporations, states that the merger was effected and the capitalization increased in order to provide simpler means of management and obtaining funds for construction purposes. It is proposed to expend more than $250,000 during 1913 in new work of all kinds at Racine and Kenosha.

General Industrial

The Wheeling Mold & Foundry Co., Wheeling, W. Va., is in the market for one 30-ton electric traveling crane, 55-foot span.

The Parker-Hirt Machine Co. has been incorporated at La Crosse, Wis., with a capital stock of $5,000 by E. W. Parker, Joseph F. Hirt and Harriet E. Parker.

A. M. Blowers, Pineville, Ky., wants a rotary hydraulic machine for the treatment of lime, a plant for the production of which is to be installed at Kendrick, Fla.

The big machines included in the list of general equipment for the Van Ness shops of the New York, New Haven & Hartford railroad, were placed during the past week.

The Midwestern Electric Mfg. Co. has been incorporated at Baraboo, Wis., with a capital stock of $25,000. Michael Debrey, R. A. Schnurr and C. F. Kindschi appear as incorporators.

Incorporation papers are being taken out by the Queen City Engineering Machine Co., Cincinnati, with a capitalization of $100,000. The new company will engage in the manufacture of machinery.

The American Steel Co., Park building, Pittsburgh, has been notified that its purchase of the National Rolling Mill Co.'s plant at Mansfield, O., has been approved by the court. The plant may be moved to western Pennsylvania.

The General Electric Co. has closed for the greater part of its machine tool list that has been out for some weeks. This equipment, which represents the expenditure of about $40,000, will go to the company's Schenectady plant.

The Chicago, Milwaukee & St. Paul railway is preparing to build a new steel bridge over Rock river at Janesville, Wis., at a cost of $75,000. The bridge will be used jointly by the St. Paul, and Chicago & North Western roads, but the expense will be borne by the St. Paul.

Operations will be begun by the Knoxville Smelting & Refining Co., Knoxville, Tenn., which was recently organized. A plant has been installed on Jacksboro street. A platform has been erected to assist in charging the furnace. It has been decided to manufacture a patented furnace for smelting operations. Allan R. Partridge holding patent rights in this connection. C. H. Mace is manager of the new plant.

Local capitalists of Redcliff, Alta., are organizing the Redcliff Rolling Mills & Bolt Co., capitalized at $250,000. A representative of the company is in the east purchasing machinery. It is hoped to have the plant in operation by spring. The output will include angle, bar and channel iron and bolts and nuts.

The plant and business of the Universal Machine Screw Co., Hartford, Conn., has been taken over by the American Hardware Corporation, New Britain, Conn. The business is capitalized at $200,000. Charles S. Phelps, Rockville, Conn., is president, and Francis G. Smith, secretary and treasurer. It employs 100 men at present.

The Ashland, Wis., Lighting Co. has purchased 1,500 frontage on Chequamegon bay, at Ashland, and proposes to ultimately install ovens for the production of coke and gas. A. E. Appleyard, general manager, states that he is negotiating with eastern coal and ore interests with a view to devoting part of the 1,500 foot frontage to a new dock.

The Elmer P. Morris Iron Works, 90 West street, New York, recently incorporated, advises that this company was organized for the purpose of dealing in iron and steel specialties designed by itself for the uses of electric lighting companies and steam and electric railroads. The company will not do any plant building but will act for various manufacturers.

The American Locomotive Co., 30 Church street, New York, is reported to have placed orders for approximately $150,000 worth of shop equipment during the past week for its Montreal plant. No general list of its requirements had been circulated. A large number of New York houses figured in the distribution of the business.

The General Electric Co., Schenectady, N. Y., McArthur Brothers Co., New York, and Allen & Peck, Inc., Syracuse, N. Y., have entered into an agreement with the directors of the Norwich, Colchester & Hartford Traction Co., Norwich., Conn., to finance, construct and manage a trolley line between Norwich and Hartford, Conn.

John R. Price, Inc., Newark, N. J., whose incorporation was recently noted, advises that it will engage principally in the manufacture of the Price automatic carburetor. It is expected that about 500 of these carburetors will be manufactured during the coming year. Later other accessories may be made, although this has not been definitely decided upon. The works of the company in Newark are at 68 Marshall street.

The Ideal Steel Wheel Co., of Cincinnati, which was recently incorporated, has bought the plant of the Seufferle Cooperage Co., on Spring Grove avenue, Cincinnati, the price being $41,000. The new company will manufacture automobile wheels as its principal output. The general dimensions of the plant secured are 200 x 225 feet, together with several minor structures. J. B. Fitch, Cincinnati, is president of the company.

The Lacrosse Water Power Co., controlling the Hatfield Power Co., and the Winona Electric Light & Street railway, and serving the Lacrosse Electric Co. with current, has sold its property at public auction, at Black Falls, Wis., after having been in the hands of receivers since October, 1911. The only bid, $500,000 was submitted by a representative of the bond holders protective committee and Chicago and Milwaukee banks and trust companies.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has taken a contract from the City Gas & Electric Co., Orel, Cal., for four 12,500-kilovolt-ampere, alternating current, 6,600-volt generators. Also one from the Pacific Light & Power Co., Los Angeles, Cal., for two 17,500-kilowatt, 6,600-volt, three-phase, water wheel type generators; one 200-kilowatt motor generator set; one 15,000-kilowatt, 6,600-volt, synchronous condenser, together with some auxiliary apparatus and 24 large transformers.

The Laclede Steel Co., St. Louis, has re-elected its directors as follows: Geo. O. Carpenter, L. R. Carter, W. E. Guy, Joseph W. Lewis, Geo. D. Markham, J. Herndon Smith and Thomas R. Akin. The board will elect officers in a few days. The company, capitalized at $400,000, began the erection of a rolling mill in Madison, Ill., more than a year ago, and the plant began operation last April. Its principal output is steel for reenforcing concrete and bedstead angles. About 200 men are employed in the plant.

The Olympic Foundry Co., Seattle, Wash., is making preparations to start a new steel foundry to compete for Alaskan business. C. W. Kucher is president-manager. Owing to difficulties in transporting castings in Alaska over the mountains, buyers naturally have strong preference for steel castings which can be made as light as possible without interfering with the requisite strength. Business in Alaska is increasing and it is thought that the field on the coast presents an excellent opportunity for a modern steel foundry.

Adelbert Kilburn, president and treasurer of the Chase Turbine Mfg. Co., of Orange, Mass., for the last five years, has sold his interest in the business to George E. Dexter, who

has been identified with the concern 27 years. Mr. Dexter has been secretary of the company for the last 11 years, and was its treasurer and general manager three years. The company manufactures water wheels and a complete line of sawmill machinery and automatic box machinery. It was established in 1866, and is one of the oldest concerns in Orange. It was incorporated in 1874.

The Wald Mfg. Co., Sheboygan, Wis., has been incorporated with an authorized capital of $30,000 to succeed to the business of the Wald Co., manufacturing tire repair tools, luggage carriers, mudguards and other automobile and cycle specialties and parts. The incorporators are Ewald Pawsat, Herman Pawsat and Felix Benfey. The Pawsat brothers organized the Wald Co. eight years ago.

The Kelly Motor Truck Co., Springfield, O., whose re-incorporation was recently noted, advises that its new name will be The Kelly-Springfield Motor Truck Co. The authorized capital will be $3,000,000. The production of 1,200 trucks is fixed for next year. To accomplish this a small increase in equipment will be necessary. About $30,000 worth of machinery will be installed, and there will be about 7,500 square feet of additional floor space. The management will remain the same, with the addition of Charles B. Shanks as general sales manager.

Plans for the revival of an important iron-working industry in Ashland, Ky., have been completed by the organization of a new company to take over an established plant. The plant of the Ashland Sheet Mill Co., which has been closed down for some time, will open again Nov. 1, with a new company, the Fannin & McCullough Sheet Mill Co., in charge. Officers of the new concern are President, Charles Russell; vice president, T. N. Fannin; secretary and treasurer, A. J. McCullough; general manager, T. J. McCullough. The concern will employ 300 men to begin with, and hopes to increase this to 500 in the near future.

The Eastern Malleable Iron Co. has been organized in Naugatuck, Conn., with a capitalization of $10,000,000, for the purpose of combining under one management foundries located in Bridgeport, Naugatuck and New Britain, Conn., Troy, N. Y., and Wilmington, Del. The members of the corporation include: Harris Whittemore, Naugatuck, Conn.; Augustus Veghte, Troy, N. Y.; Henry Atwater, Bridgeport, Conn.; William Sleicher, Troy, N. Y.; S. E. Hopkins, Naugatuck, Conn.; William J. Griffin, Bridgeport, Conn.; E. Mannweler, Naugatuck, Conn.; C. L. Berger, Naugatuck, Conn.; Harry S. Pearson, Bridgeport, Conn.; John E. Wallier, Wilmington, Del., and Waldo K. Chase, Farmington, Conn.

The Thor Iron Works, Ltd., Toronto, Can., recently incorporated with a capital stock of $100,000, will manufacture steel plate work of all descriptions, and structural steel for buildings and bridges and will execute marine repairs and conduct a general iron and steel manufacturing business. The company has bought the plant and equipment, excepting the land, of the Toronto Shipyards Co., and will alter the present plant slightly and use it for manufacturing tanks, etc. The machinery is modern and is operated in the most up-to-date manner by separate electric motors. It is expected that at the outset the principal business done will be in the line of plate work, the construction of tanks, standpipes, watertowers, flumes, penstocks, blast furnaces, etc.

The Tacony File & Hardware Co., Tacony, Philadelphia, recently incorporated with a capital of $100,000, reports that the new company represents the incorporation of the business conducted for the past 26 years under the name of William Shedinger for the manufacture of Swiss pattern files. In addition to the old line of Swiss pattern and vulcanite files, it is the intention of the new company to manufacture a high grade of common American files and to eventually include hardware specialties among its products. Plans have been prepared for a new reinforcement and concrete building, 25 x 100 feet and 3 stories in height. The officers of the new company are: W. M. Griscom, president; R. L. Griscom, vice president; Wm. Shedinger, secretary; F. G. Griscom, treasurer.

The fabricating shop of the Passaic Steel Co., Passaic, N. J., which is being opened by a committee of bond holders is being greatly increased in capacity through gradual occupancy of some of the buildings of the old steel works and rolling mills. The shop now has a capacity of over 2,000 tons a month and has work on hand for three months ahead. The rolling mills and steel works of the plant, which have not been operated in recent years, are being gradually dismantled and will be abandoned. Some of this equipment was recently sold to other mills. The works of the Passaic Steel Co. were originally built in 1869 under the name of the Passaic Rolling Mill Co. In 1902 a new company was formed and incorporated under the present title. The plant was then greatly enlarged to include a steel making equipment of seven basic open-hearth furnaces, two of them of 50 tons and five of 25 tons capacity and three finishing mills, including one 21-inch, one 28-inch and one 30-inch universal. The works had an annual capacity of about 100,000 tons of beams, channels, angles and universal mill plates. Several years ago the company went into the hands of a receiver and later, operations in the fabricating shop were resumed under the direction of a committee of bondholders. It is the intention to permanently operate this portion of the works.

Trade Notes

The Lake Erie Nail & Supply Co., Cleveland, has changed its name to the Lake Erie Machinery & Supply Co.

The Manthey-Sieker Co., machinist and engineer, 784-790 Thirtieth street, Milwaukee, Wis., has changed its corporate title to the Manthey Mfg. Co.

The Rockford Iron & Steel Co., scrap dealer, has moved from Rockford, Ill., to 1107-8 City Hall square building, Chicago.

In order to get increased capacity the Curpatca Machine Co., South Bend, Ind., has leased the old Snell foundry in that city.

The S. Jarvis Adams Co., Pittsburgh, announces change of its name to Pittsburgh Iron & Steel Foundries Co.; also that its general offices were moved on Oct. 12 to the works, Midland, Pa.

The Geo. M. Newhall Engineering Co., Philadelphia, representing the Industrial Works, Bay City, Mich., manufacturer of locomotives and wrecking cranes, has opened a Pittsburgh office at 944 Oliver building.

Fires

Slight damage was done by fire to the foundry of the Bettendorf Axle Co., Bettendorf, Ia., recently. The blaze was caused by the premature ignition of gas.

A loss of about $3,000 was incurred by the William Rinker Co., manufacturer and machinist, St. Paul, Minn., when the building in which it is located took fire recently. The chief damage was done to the machinery by smoke and water.

The plant of the Enterprise Foundry Co., Pittsburgh, was damaged by fire, recently, to the extent of $8,000. The building, which is a one-story brick in front and a story and a half in the rear, is about 75 x 125 feet. The rear of the building and the roof were badly damaged.